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A Revision of the Genus *Athysanella* and Some Related Genera (Homoptera-Cicadellidae)

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ABSTRACT: The following genera of leaf hoppers in America north of Mexico are revised: *Athysanella*, *Gladionura*, *Amphipyga*, *Pectinapyga*, *Gillettella* and *Doratura*. Keys to the genera, subgenera and species are included, as well as illustrations of male genitalia and the last ventral segment of the females. Discusses 82 species, of which 65 are new. The new categories described and nomenclatorial changes made are as follows: new synonymy; *Amphipyga* Osb. (= *Pectinapyga* Osb.); *Athysanella* (*Gladionura*) *sinuata* Osb. (= *Gladionura abbreviata* Osb.); *Athysanella gardenia* Osb. (= *Gladionura frigida* Osb.); *Athysanella robusta* Bk. (= *Athysanella montana* Osb.); *Athysanella* (*Amphipyga*) *aridella* Osb. (= *Amphipyga californica* Osb.); *Athysanella* (*Amphipyga*) *terana* Osb. (= *Gladionura aridicola* Osb.); *Athysanella* (*Amphipyga*) *attenuata* Bk. (= *Amphipyga alta* Osb.) (= *Athysanella extrusa* Osb.); *Athysanella* (*Amphipyga*) *occidentalis* Bk. (= *Athysanella minuta* Bk.); *Athysanella* (*Gladionura*) *curtipennis* Gill. and Bk. (= *Gladionura extensa* Osb.); *Gillettella labiata* (Gill.) (= *Deltocephalus labiata* var. *rufus* Gill.); new subgenera; *Brachydella* (type, *Brachydella abdominalis* n. sp.; *Pedumella* (type, *Pedumella spatulata* n. sp.): *Gladionura* and *Amphipyga* are reduced to subgenera of *Athysanella*; new species described: *Athysanella fredonia*, *Athysanella plana*, *Athysanella incerta*, *Athysanella parca*, *Athysanella laeta*, *Athysanella tenera*, *Athysanella aspersa*, *Athysanella globosa*, *Athysanella foeda*, *Athysanella kanabana*, *Athysanella salsa*, *Athysanella rostrata*, *Athysanella supina*, *Athysanella bifida*, *Athysanella planata*, *Athysanella* (*Amphipyga*) *ardua*, *Athysanella* (*Amphipyga*) *playana*, *Athysanella* (*Amphipyga*) *rubicunda*, *Athysanella* (*Amphipyga*) *skullana*, *Athysanella* (*Amphipyga*) *triodana*, *Athysanella* (*Amphipyga*) *nimbata*, *Athysanella* (*Amphipyga*) *anzana*, *Athysanella* (*Amphipyga*) *obesa*, *Athysanella* (*Amphipyga*) *minor*, *Athysanella* (*Amphipyga*) *minor* var. *major*, *Athysanella* (*Amphipyga*) *turgida*, *Athysanella* (*Amphipyga*) *hamata*, *Athysanella* (*Amphipyga*) *wilburi*, *Athysanella* (*Amphipyga*) *modesta*, *Athysanella* (*Amphipyga*) *kansana*, *Athysanella* (*Gladionura*) *dubia*, *Athysanella* (*Gladionura*) *truncata*, *Athysanella* (*Gladionura*) *blanda*, *Athysanella* (*Gladionura*) *blanda* var. *vana*, *Athysanella* (*Gladionura*) *callida*, *Athysanella* (*Gladionura*) *uncinata*, *Athysanella* (*Gladionura*) *casa*, *Athysanella* (*Gladionura*) *alsa*, *Athysanella* (*Gladionura*) *rata*, *Athysanella* (*Gladionura*) *libera*, *Athysanella* (*Gladionura*) *molesta*, *Athysanella* (*Gladionura*)

nura) adunca, Athysanella (Gladionura) sinuata var. *lobata, Athysanella (Gladionura) lunata, Athysanella (Gladionura) concava, Athysanella (Gladionura) clavata, Athysanella (Gladionura) directa, Athysanella (Gladionura) nigricentralis, Athysanella (Gladionura) dentata, Athysanella (Gladionura) curvata, Athysanella (Gladionura) contracta, Athysanella (Gladionura) sagittata, Athysanella (Gladionura) arcana, Athysanella (Gladionura) diversa, Athysanella (Brachydella) abominalis, Athysanella (Pedumella) spatulata, Gillettiella fasciata.*

INDEX

	PAGE		PAGE		PAGE
abbreviata	53	emarginata	49	obesa	34
abdominalis	64	excavata	59	occidentalis	39
acuticauda	40	extensa	43	parca	15
adunca	53	extrusa	37	Pectinapyga	65
alsa	48	fasciata	69	Pedumella	65
alta	37	foeda	19	plana	13
Amphipyga	25	fredonia	12	planata	24
anzana	32	frigida	11	playana	27
arcana	62	fureulata	50	rata	50
ardua	27	gardenia	11	recurvata	66
argenteola	63	Gillettiella	67	reticulata	33
aridella	34	Gladionura	42	robusta	18
aridicola	31	globosa	18	rostrata	21
aspera	17	hamata	37	rubieunda	28
Athysanella	9	incerta	15	sagittata	62
atropunctata	68	incongrua	13	salsa	20
attenuata	37	kanabana	20	sinuata	53
balli	32	kansana	41	skullana	28
bifida	23	labiata	67	spatulata	66
blanda	45	laeta	16	stylata	33
Brachydella	64	libera	51	D. stylata	69
californica	34	lobata	54	supina	22
callida	46	lunata	55	tenera	17
casa	48	magdalena	11	terebrans	14
clavata	57	major	36	texana	31
concava	55	minor	35	triodana	30
contracta	61	minuta	39	truncata	45
curtipennis	43	modesta	40	turgida	36
curvata	60	molesta	52	uncinata	47
dentata	59	montana	18	utahna	22
directa	57	naazarana	56	vana	46
diversa	64	nigrofascia	29	viridia	52
Doratura	69	nigricentralis	58	wilburi	38
dubia	44	nimbata	30	yumana	25

THIS paper deals with the species of the following genera of leaf hoppers in North America north of Mexico: *Athysanella* Bk.; *Gladionura* Osb.; *Amphipyga* Osb.; *Pectinapyga* Osb.; *Gillettella* Osb.; *Doratura* Shlb. (in America); *Brachydella* n. sub. g. and *Pedumella* n. sub. g. *Gladionura* and *Amphipyga* are reduced to subgenera of *Athysanella*, *Pectinapyga* is placed as a synonym of *Amphipyga*, and *Doratura* is reported for the first time in this country.

The revision was begun several years ago because of the inability to classify satisfactorily the great amount of material then in the Snow Entomological Collection and the private collection of the senior author. Doctor Ball's serious illness in February, 1937, very materially handicapped the progress of the work. However, in spite of this misfortune it seemed best to go ahead and finish the paper, omitting all host-plant records and life-history material, in the hope that Doctor Ball will again be able to go ahead with that portion of the study at some future date.

Many thousands of specimens have been examined. Aside from all the material that was in the collections of the country, the Biological Survey of the University of Kansas made this group a "special order of business" in the summers of 1935, 1936 and 1937, visiting especially those regions known to be most suitable to these insects. Special effort was made to obtain better series of some of the forms represented by too few specimens. As a result we have been able to study a great many individuals of most of the species. We have also been fortunate in being able to study all the available type material.

ACKNOWLEDGMENTS

We desire to express our appreciation to all those individuals and institutions who have so generously aided us with loans of specimens. We are especially indebted to P. W. Oman of the United States National Museum for much helpful advice and comparisons of type material and to Dr. J. N. Knull of Ohio State University for the privilege of studying the Osborn types.

DISTRIBUTION

The members of this group of leaf hoppers are pretty well scattered over North America, but since they feed entirely upon grasses and the most of them upon the so-called "short-grasses," we find a concentration of species in the desert regions of the Southwest. Arizona, New Mexico, Colorado and Kansas have yielded by far the most of our forms. Some of the species seem to have a wide dis-

tribution, while others are quite restricted. This can probably be correlated with food-plant distribution.

TECHNIQUE

This study is based largely on male external and internal genitalia. Slide mounts are made by removing the abdomen of the male, placing it in ten percent caustic for a short time (1-2 minutes) until cleared, transferring to water, then to a drop of glycerine, where the pygofer is removed from the plates by splitting the body wall along the sides and rupturing it about the base of the aedeagus. These two portions are then mounted in diaphane inside down on glass slides. Cover slips are pressed uniformly in place in order to give each structure as nearly the same view as possible. Negative prints on photostat paper have been made from these slides by projection and are used in our plates.

DIAGNOSTIC CHARACTERS

The head-shape and the type of male genitalia are used for generic separation. The presence or absence of a spine on the hind tibia, together with the shape of the pygofer of the male, forms the basis for subgeneric distinction and the shape of the male plates, styles, aedeagi, and the last ventral segment of the females plus the usual presence or absence of round, black spots on the margin of the vertex, forms the basis for the separation of species. Genitalic characters have proven much more stable than vertexal or color.

Each species usually has both a short- and a long-winged form, especially in the female, the short-winged individuals predominating. During our study of thousands of individuals we have been impressed by the numerous examples of freaks of both sexes; that is, specimens in which both internal and external parts of the genitalia are only partially developed. As to what may have caused this abnormality we have no suggestions to make. It has not been uncommon to find one freak in every twenty-five specimens. It is entirely possible, therefore, as has occurred, to have one of these undeveloped individuals described as the type of a species.

TAXONOMIC POSITION

This group of leaf hoppers belongs to the subfamily Jassinae, which is distinguished from other subfamilies of the Cicadellidae by having ocelli on or near the margin of the vertex. They are usually short winged with indistinct venation and the females usually have long, sharp ovipositors.

KEY TO GENERA

1. Vertex margin between ocelli thick, rounding to front, or if vertex margin is sharp with a spur on apex of hind tibia..... 2
 Vertex margin between ocelli foliaceous; no spur on apex of hind tibia of male *Doratura*, p. 69
2. Head long, cone-shaped..... *Gillettiella*, p. 67
 Head broadly angled, not cone-shaped..... *Athysanella*, p. 9

THE GENUS ATHYSANELLA

C. F. Baker described the genus *Athysanella* in 1898 (*Psyche*, Vol. VIII, p. 185), designating *A. magdalena* Bk. type. In 1930 (*Ann. Ent. Soc. Am.*, Dec., pp. 687-721) H. Osborn, in a revision of the genus, described four new genera: *Gillettiella*, *Pectinapyga*, *Amphipyga*, and *Gladionura*. After a study of the many thousands of specimens the authors were convinced that a truer picture of relationships would be shown by retaining *Gillettiella*, placing *Pectinapyga* as a synonym of *Amphipyga*, and reducing *Gladionura* and *Amphipyga* to subgenera of *Athysanella*. To complete this picture it was necessary to describe two more subgenera: *Brachydella* and *Pedumella*.

These leaf hoppers are usually small, less than 6.5 mm. in length, with vertex angled to rounded, usually brachypterous, some long winged forms present in each species, venation indistinct, ovipositor of female usually long and sharp and male genitalia usually large and of a more or less open type.

KEY TO SUBGENERA OF ATHYSANELLA

1. Male pygofer ending in a hook or long narrowed process at outer ventral corner... 2
 Male pygofer broadly rounded..... 3
2. Hind tibia of male with large spur at apex..... 4
 Hind tibia of male without large spur at apex..... *Pedumella*, p. 65
3. Hind tibia of male with spur at apex..... *Athysanella*, p. 9
 Hind tibia of male without spur at apex..... *Amphipyga*, p. 25
4. Vertex margin from eye to eye broadly rounded, very sharp, disc concave *Brachydella*, p. 64
 Vertex margin from eye to eye more or less angular, never extremely sharp *Gladionura*, p. 42

The Subgenus ATHYSANELLA Bk.

Athysanella-like leaf hoppers, the males of which have rounded pygofers and spurs on apex of hind tibia. Type of the genus *A. magdalena* Bk.

KEY TO THE SPECIES OF ATHYSANELLA

1. Usually with two or three round, black spots on margin of vertex..... 2
 Usually without round, black spots on margin of vertex..... 13
2. (1) Outer third of style bifid..... 4
 Outer third of style not bifid..... 3
3. (2) Styles protruding beyond plates..... *gardenia*, p. 11
 Styles about as long as plates..... *globosa*, p. 18

4. (2) Plates long with apices sharp pointed, last ventral segment of female with median lobe much longer and broader than laterals.....*magdalena*, p. 11
Plates rounded; last ventral segment of female with median lobe not longer and broader than laterals..... 5
5. (4) Dorsal and ventral points of style extending caudally about the same..... 6
Dorsal point of style extending much further caudad than ventral..... 11
6. (5) Excavation between points of style very slight..... 7
Excavation quite deep between points of style..... 8
7. (6) Dorsal point of style sharp at apex.....*fredonia*, p. 12
Dorsal point of style thick with apex rounded.....*plana*, p. 13
8. (6) Dorsal point of style rounded at tip; last ventral segment of female with median lobe much shorter than laterals..... 9
Dorsal point of style truncate at tip; last ventral segment of female with lobes about equal in length..... 10
9. (8) Tip of aedeagus rounded; last ventral segment of female with deep excavation with small median lobe.....*terebrans*, p. 14
Tip of aedeagus sharp on dorsal margin; last ventral segment of female with median lobe half as long as laterals.....*incongrua*, p. 13
10. (8) Hook at end of aedeagus forming almost a circle; last ventral segment of female with medium lobe very broad, shorter than laterals.....*incerta*, p. 15
Hook at end of aedeagus barely curved; last ventral segment of female with central lobe narrower and of about same length as laterals.....*parca*, p. 15
11. (5) Aedeagus widest near tip.....*laeta*, p. 16
Aedeagus not widest near tip..... 12
12. (11) Color stramineous; ventral point of style in caudal view ending in a ventral curving hook; lateral lobes of last ventral segment of female long and slender.....*tenera*, p. 17
Color cinereous; ventral point of style not curving ventrally in a hook; lateral lobes of last ventral segment of female triangular in shape.....*aspera*, p. 17
13. (1) Style of male not bifid on outer third..... 14
Style of male bifid on outer third..... 15
14. (13) Aedeagus with serrate process arising on ventral margin at base; plates triangular, pygofer ribbon-shaped.....*robusta*, p. 18
Aedeagus without such a process; plates not triangular; pygofer but slightly narrowed.....*globosa*, p. 18
15. (13) Dorsal point of style apparently more than twice as long as ventral..... 16
Dorsal point of style more nearly the same length as ventral..... 19
16. (15) Almost no ventral point of style, ventral point extending caudad by the length of the ventral point..... 17
Ventral point definite, about equal to dorsal in extension caudad.....*foeda*, p. 19
17. (16) Aedeagus in lateral view widest near apex; ventral margin serrate; dorsal point of style long and slender, sides almost parallel.....*kanabana*, p. 20
Aedeagus in lateral view with sides almost parallel or widest near middle; dorsal point of style with sides converging or long and sickle-shaped..... 18
18. (17) Aedeagus with hook at apex almost forming a circle; dorsal point of style with sides converging; last ventral segment of female with median lobe much shorter than laterals.....*salsa*, p. 20
Aedeagus with hook at apex barely curved; dorsal point with sides almost parallel, sickle-shaped; middle lobe of last ventral segment of female longer than laterals.....*rostrata*, p. 21
19. (15) Ventral point of style viewed caudally almost without lateral flanges.....*utahna*, p. 22
Ventral point of style viewed caudally with lateral flanges..... 20
20. (19) Apex of style viewed laterally with very shallow excavation between points, much less than width of dorsal point at middle.....*suprina*, p. 22
Apex of style in lateral view with deep excavation, deep as width of dorsal point at middle..... 21
21. (20) Ventral margin of style in caudal view deeply excavated.....*bifida*, p. 23
Ventral margin of style in caudal view not excavated..... 22
22. (21) In ventral view outer margin of dorsal point of style sharply sloped toward inner margin at apex.....*planata*, p. 24
In ventral view outer margin of dorsal point of style not sloped toward inner margin at apex.....*yumana*, p. 25

1.* *Athysanella gardenia* Osb.

Athysanella gardenia Osborn, Herbert, Annals Ent. Soc. Am., XXIII, p. 701, 1930.

Gladionura frigida Osborn, Herbert, Annals Ent. Soc. Am., XXIII, p. 709, 1930.

This is a common Colorado species characterized by the long protruding styles, and widely separated, triangular plates. Length: Male, 2.75 mm.; female, 3.75 mm.

Vertex flat, margins rounded; style protruding; spur on hind tibia of male extending slightly beyond middle of first tarsal segment.

Color cinereous; vertex with two large black spots on margin and a smaller spot at apex; elytra dusky, with veins lighter; dorsum of abdomen with usual dark marks.

Genitalia. Pygofer broadly rounded; valve triangular; plates about as wide at base as valve, sinuately narrowed to rounded apices, mesally widely separated, apices with distinct tooth just laterad of middle. Styles long with one margin almost straight, other curved, strongly protruding; aedeagus in lateral view slightly curved dorsally, slightly widened apically, apex dorsally convex. Last ventral segment of female with lateral margins greatly extended, posterior margin deeply excavated with small median tooth.

The holotype and allotype were not designated in the original description nor were they marked in any collection. A lectoholotype (No. 43183) male, and female lectoallotype (No. 43183), Garden of the Gods, Colorado, Webster No. 7104; in the United States National Museum are here designated.

2. *Athysanella magdalena* Baker

Athysanella magdalena Baker, C. F., Psyche, March, 1898, p. 185.

This species, selected by Baker as the type of the genus, is one of the commonest in the Rocky Mountain region. Of small size, it may be recognized by the very long, sharp-pointed plates of the male and bifurcate style and the trilobed posterior margin of the last ventral segment of the female, with the median lobe wider and longer than the laterals. Length: Male, 2.5 mm.; female, 3.5 mm.

Vertex flat, margins rounded; style usually visible; spur on hind tibia of male about two-thirds as long as first tarsal segment.

Genitalia. Male pygofer broadly rounded, almost truncate at apex; valve obtusely rounded; plates as broad as valve at base, very long, tapering to sharp apices; styles long, enlarging toward apex, humped on inner margin, apex bifid. Aedeagus of medium length, slightly curved dorsally, ventral margin lightly serrate. Last

* Numeral preceding each species refers to number on plates.

ventral segment of female about twice as long as preceding, posterior margin deeply trilobed, middle lobe much wider and longer than laterals.

Lectoholotype female, Magdalena Mts., New Mexico, August, 1894, F. H. Snow, and lectoallotype male, Forrester's Ranch, Laramie county, Colorado, August 3, 1896 (No. 2013 of Baker), are here designated. Types in United States National Museum.

Specimens are at hand from Colorado, New Mexico, Arizona and Utah.

3. *Athysanella fredonia* n. sp.

Resembling *incongrua* Bk., but lateral margins of last ventral segment of female heavy, not longer than middle portion, styles of males not bifid, and aedeagus with ventral margin serrate, with apex hooked. Length: Male, 3 mm.; female, 4.5 mm.

Vertex flat, margins rounded; styles of male usually visible; spur on hind tibia of male long, almost as long as first tarsal segment.

Color cinereous to tawny, with darker markings; vertex with two black spots on margin and a smaller one at apex from which extends two short dashes; disc with inverted L-shaped marks; pronotum more or less infuscated; elytra dark with light veins; dorsum of abdomen with usual dark spots.

Genitalia. Pygofer of male almost rectangular, lateral margins slightly converging, apex truncate; valve angular with rounded apex; plates narrower than valve at base, outer margin slightly converging to bluntly rounded apex; styles with apices greatly enlarged, not bifid, end view shows a typical out-and-in curve on inner portion; aedeagus in lateral view large, widest near outer third, ventral margin serrate, apex hooked. Last ventral segment of female about as long as preceding, posterior margin angularly excavated from slightly rounded lateral margins to a rather broad, rounded median tooth.

Holotype male, allotype female, and 3 males and 2 females, Fredonia, Ariz., August 6, 1930, E. D. Ball; paratypes as follows: numerous specimens, both sexes, Grand Junction, Colo., August 16, 1936, White's City, N. Mex., July 17, 1936, Flagstaff, Ariz., July 27, 1936., R. H. Beamer; 20 females and 17 males, Kanab, Utah, E. D. Ball; 7 males and 8 females, Grand Canyon, Ariz., E. D. Ball; other specimens are at hand from the following localities: Las Animas, Colo.; Garden of Gods, Colo.; St. Johns, Ariz.; Santa Fe, N. Mex.; Pearce, Ariz.; Mustang Mts., Ariz.; Springer, N. Mex.; Hartford, N. Mex.; Williams, Ariz.; Ash Fork, Ariz.; Westwater,

Utah; Parowan, Utah; Painted Desert, Ariz.; Glenn Oaks, Ariz.; Lupton, Ariz.; Huachuca Mts., Ariz.

Types and paratypes in collection of E. D. Ball, paratypes in Snow Entomological Collection and United States National Museum.

4. *Athysanella plana* n. sp.

Resembling *aspera*, but female with last ventral segment with lateral margins longer and more slender and median excavation deeper, and styles of male with apex broad and but slightly curved from lateral view, outside of inner projection sloped to meet inner margin in sharp line. Length: Male, 3 mm.; female, 5 mm.

Vertex flat, margins rounded; styles usually visible; spur on hind tibia of male almost as long as first tarsal segment.

Color tawny, with darker markings; vertex with two black spots on margin and a smaller spot at apex, with two backward projecting dashes; semblance of boxlike marks on disc; elytra dark with light veins; dorsum of abdomen with usual dark markings.

Genitalia. Pygofer of male broadly rounded; valve about as long as preceding; plates broader than valve at base, sharply converging on outer margin to truncate apices; styles with large fingerlike inner projection, in lateral view outer margin but slightly and very evenly curved, inner prong with its outside sharply sloped to inner at apex; aedeagus in lateral view constricted at base, ending in blunt hook. Last ventral segment of female at least twice as long as preceding, lateral margins prolonged into slender points, posterior margin deeply excavated with a definite median tooth not more than a third as long as lateral wings.

Holotype male, allotype female, and numerous paratypes, Califa, Cal., June 12, 1935, P. W. Oman; 2 male and 1 female paratypes, Visalia, Cal., June 11, 1909, E. D. Ball. Types and paratypes in U. S. National Museum, paratypes in collection of E. D. Ball.

5. *Athysanella incongrua* Baker

Athysanella incongrua Baker, C. F., Psyche, March, 1898, p. 188.

Resembling *terebrans*, but may be separated by the angular apex of aedeagus, by the parallel-margined inner process of style, and by the less deeply excavated posterior margin of the last ventral segment of the female, the lateral projections less than twice the length of median tooth. Length: Male, 3.75 mm.; female, 4.75 mm. Vertex flat to rounded, margins rounding; styles usually visible; spur on hind tibia of male usually slightly more than half as long as first tarsal segment.

Color cinereous to tawny, marked with darker; vertex usually with three black spots on margin; pair of dark triangles back of median spot often present; elytra often dark; veins usually lighter; dorsum of abdomen with usual spotting.

Genitalia. Pygofer broadly rounded; valve obtusely rounded; plates as broad as valve at base, scarcely narrowed to broadly rounded apices diverging mesally; style at apex broadly U-shaped, inner fork parallel-sided, with apex rounded. Aedeagus in lateral view gradually widening to avicephalic apex. Last ventral segment of female with lateral margins extended, posterior margin excavated with a broad median tooth. Lateral margins scarcely twice as long as median tooth.

Lectoholotype male, Fort Collins, Colo., July 21, C. F. Baker, in United States National Museum. Allotype female, Peyton, Colo., August 19, 1936, R. H. Beamer, in Snow Entomological Collection. Specimens have been examined from Kansas, Nebraska, Oklahoma, Colorado, and New Mexico.

6. *Athysanella terebrans* (Gill. & Baker)

Euttetix terebrans Gillette and Baker, Hemip. Colo., p. 102, 1895.

Resembling *incongrua* Baker, but end of aedeagus blunt, the inner fork of style sharp, and much deeper excavation of the posterior margin of the last ventral segment of the female. Length: Male, 3 mm.; female, 5 mm.

Vertex flat to excavated; margins rounded; style usually exposed; spur on hind tibia of male not more than half as long as first tarsal segment.

Color cinereous, with darker markings; vertex with two black spots on margin and a smaller spot at apex, with a pair of dots back of apex and semblance of boxlike marks on disc; elytra with veins lighter, with dusky stripes; abdomen spotted, as usual.

Genitalia. Pygofer broadly rounded; valve obtusely rounded; plates as broad as valve at base, converging to broadly rounded apices, diverging on mesal line. Style U-Shaped at apex, inner process narrowing to apex, not broadly rounded as in *Athysanella incongrua* Baker. Aedeagus in lateral view gradually increasing in size toward tip, dorsal and ventral margins more or less serrate, apex rounded. Female last ventral segment deeply excavated on posterior margin, lateral extensions at least twice as long as median notch.

Specimens have been studied from Colorado, Utah, Wyoming, and Nebraska. Allotype male, Wray, Colo., July 13, 1899. In Collec-

tion Colorado Agricultural College, Fort Collins, Colo. Holotype female, North Park, Colo., July 30 (Gillette), in United States National Museum.

7. *Athysanella incerta* n. sp.

Resembling *parca*, but may be separated by the deeper notch in the apex of style and by the almost complete circle made by the hook at apex of aedeagus. Length: Male, 3 mm.; female, 4.5 mm.

Vertex flat, margins medium; apices of styles usually visible; spur on hind tibia of male almost as long as first tarsal segment.

Color yellowish-green, vertex usually with three black spots; elytra semihyaline, veins often lighter; dorsum of abdomen with usual spots.

Genitalia. Pygofer broadly rounded, posterior margin almost truncate. Valve obtusely rounded. Plates about as wide as valve at base, almost touching on mesal margin, evenly narrowed to broadly rounded apices. Styles slender to much enlarged bifid apical third, two parts almost equally projecting. Aedeagus in lateral view curved slightly dorsally, sides almost parallel, enlarged slightly at apex, dorsal side cut away at apex, ventral corner produced into an almost circular hook. Posterior margin of last ventral segment of female with lateral angles broad and produced, mesal portion broadly produced about half as far as lateral angles.

Holotype male, allotype female, 16 male and 6 female paratypes, Lamar, Colo., August 20, 1936, R. H. Beamer; other paratypes, nine pairs from Las Animas, Colo., August 20, 1936, R. H. Beamer; 2 males, Wray, Colo., July 28, 1900; 5 males, Canyon, Colo., July 13, 1898; 15 pairs, Lusk, Wyo., July 21, 1935, P. W. Oman. Types and paratypes in Snow Collection, paratypes in United States National Museum and Colorado Agricultural College Collection.

8. *Athysanella parca* n. sp.

Resembling *salsa*, but with round, black spots on vertex, with plates of male much longer with round apices, with apex of style much heavier and finger process not projecting beyond apex, apex of aedeagus with about a half hook and last ventral segment of female with median lobe about as long as laterals. Length: Male, 3.25 mm., female, 4.25 mm.

Vertex flat, margins medium; apex of styles visible; spur on hind tibia of male almost as long as first tarsal segment.

Color yellowish-green, vertex with two black spots on margin with smaller spot at apex; veins of elytra sometimes lighter; usual spots on abdomen.

Genitalia. Pygofer broadly rounded, outer margin almost truncate. Valve obtusely angulate; plates narrower than valve at base, separated on mesal line, evenly narrowed to rounded apices. Styles with rather narrow shaft, outer third very much enlarged, shallowly bifid, finger process not reaching beyond apex of shaft. Aedeagus in lateral view almost parallel-sided, slightly enlarged at apex, dorsal corner of apex cut away, ventral corner ending in about a half hook. Last ventral segment of female with lateral angles of posterior margin produced into prominent lobes; median lobe heavier and almost as long as laterals, flanked on either side by semblance of lobe.

Holotype male, allotype female and numerous paratypes of both sexes, Belen, N. Mex., July 20, 1936, R. H. Beamer and D. R. Lindsay. Numerous other specimens are at hand from Roswell, N. Mex., July 16, 1936, same collectors.

9. *Athysanella laeta* n. sp.

Resembling *terebrans*, but much smaller, with longer inner points of styles, aedeagus sharp-pointed, and lateral margins of last ventral segment of female short as in *incongrua*. Length: Male, 3 mm.; female, 4 mm.

Vertex flat to concave, margins sharp; apex of style usually visible, spur on hind tibia of male about two-thirds as long as first tarsal segment.

Color cinereous to fulvous with darker markings; vertex usually with two black marks on margin and a smaller spot on apex; elytra darker or subhyaline, with veins lighter; abdomen with usual darker marks.

Genitalia. Pygofer with apices rounded; valve roundly obtuse; plates at base about as wide as valve; styles bifid at apex, process at right angles to shaft long and narrow, reaching beyond apex of shaft; aedeagus in lateral view curved dorsally, gradually widening to sharp apex. Last ventral segment of female with lateral margins prominent, posterior margin deeply excavated, with a median tooth about half as long as lateral margins.

Holotype male, Huachuca Mts., Ariz., July 15, 1934; allotype female, same data except July 14; paratypes as follows: numerous specimens, Huachuca Mts., Ariz., September 5, 1936, E. D. Ball; 4 males and 4 females, same data as allotype, and one pair same data as holotype; 2 females, Mustang Mts., Ariz., August 22, 1935, R. H. Beamer. Other specimens at hand from Springer, N. Mex.

Types in Collection of E. D. Ball; paratypes in Snow Entomological Collection.

10. *Athysanella tenera* n. sp.

Resembling *foeda*, but much smaller, hardly half as large, vertex with round, black spot on lateral margin and last ventral segment of female with lateral projections broader, more rounded at apex, and outer margin excavated. Length: Male, 3 mm.; female, 4.25 mm.

Vertex flat, margins medium; apex of styles usually visible; spur on hind tibia of male, about two-thirds as long as first tarsal segment.

Color cinereous to stramineous, vertex with three small black spots on margin, veins of elytra lighter; spots on dorsum of abdomen about as usual.

Genitalia. Male pygofer almost rectangular with broadly rounded apex; valve slightly shorter than preceding segment, obtusely angulate; plates broader at base than valve, outer margin almost straight, inner margin rounded from slightly beyond apex of valve to practically truncate apices, angled toward outer margin; style enlarged on outer half, almost trifid at apex, inner process long and slender; portion next plate concave, angled with apex of plate margin; aedeagus in lateral view broadest at middle, quite narrowed at apex, ventral margin finely serrate. Last ventral segment of female slightly longer than preceding, lateral margins slightly excavated to long lateral processes, fairly broad with rounded apices, posterior margin deeply excavated to broad, slightly produced median portion.

Holotype male, allotype female, and numerous paratypes, Las Vegas, Nev., August 8, 1936; R. H. Beamer. Types in Snow Entomological Collection.

11. *Athysanella aspera* n. sp.

Resembling *terebrans*, but median tooth in last ventral segment of female less definite, dorsal prong of style projecting beyond outer, and aedeagus ending in a hook. Length: Male, 2.75 mm.; female, 4.25 mm.

Structure. Vertex about a right angle, flat, almost concave in male; hind tibia of male with spur almost as long as first tarsal segment.

General color cinereous, with darker markings; vertex usually with three black spots on margin; pronotum more or less flecked with dark; elytra with darker longitudinal stripes; abdomen about as usual.

Genitalia. Pygofer of male broadly rounded; valve about as long as preceding segment; plates broader than valve at base, short, sides converging slightly to truncate apices; styles with apices bifid, inner fork extending beyond outer; aedeagus in lateral view broadest at base, ending in slightly curved tip. Last ventral segment of female about twice as long as preceding, lateral margins greatly produced, posterior margin deeply excavated with more or less definite median tooth.

Holotype male, allotype female, 14 male and 11 female paratypes, Mojave, Cal., July 1, 1931, E. D. Ball; numerous paratypes, Lancaster, Cal., June 8, 1935, P. W. Oman. Types in collection of E. D. Ball and paratypes in collection of United States National Museum.

12. *Athysanella robusta* Baker

Athysanella robusta Baker, C. F., Psyche, March, 1898, p. 187.

Athysanella montana Osborn, Herbert, Annals Ent. Soc. Am., Vol. XXIII, 1930, p. 700.

A rather stout species easily separated by the long ribbonlike pygofer of the male, by the short triangular, widely separated plates and the long, toothed, ventral process of the aedeagus. Length: Male, 3 mm.; female, 4 mm.

Vertex slightly convex, margins rounded; only the apices of styles visible externally; spur on hind tibia of male very short, sometimes absent.

Color cinereous, often suffused with brown; elytra with veins lighter, abdomen with usual spots.

Genitalia. Male pygofer apically narrowed to about one-third median basal width, more or less rolled outward. Valve obtusely angled, much longer than wide; plates triangular, broadly separated medially, outer margin much longer. Aedeagus very slightly curved dorsally with ventral process almost as long as shaft, toothed on inner and outer margins. Style short, slightly protruding, tip rounded.

Due to an incorrect identification of Baker's *robusta*, this species was renamed *montana*. Types of both have been examined. Additional specimens at hand from Colorado, Wyoming and Russell, Manitoba, Canada.

13. *Athysanella globosa* n. sp.

Resembling *robusta*, but small, last ventral segment of female more definitely three-lobed, male pygofer narrowed, but not nearly so ribbonlike, plates much longer, narrower, with truncate apices

and aedeagus without the toothed ventral processes separated from the shaft. Length: Male, 3 mm.; female, 4 mm.

Vertex flat, margins rounding; styles not visible externally; spur on hind tibia of male not quite extending to middle of first tarsal segment.

Color stramineous to tawny; vertex usually with three small black spots on margin; veins of elytra lighter; spots on abdomen quite faint.

Genitalia. Pygofer of male abruptly narrowed, inner margin curving to sharp outer angle; valve about as long as preceding segment, angled; plates wider than valve at base, mesally separated, about as long as greatest width, apices truncate; styles slightly projecting with flat spatulate apices; aedeagus in lateral view widest on middle third, ventral margin serrate on same third, apical third narrower. Last ventral segment of female slightly longer than preceding, lateral margins produced, posterior margin broadly excavated, middle slightly produced, with a tendency to appear notched on either side.

Holotype male, allotype female, 1 male and 3 female paratypes, Grand Canyon, Ariz., E. D. Ball, and in his collection.

14. *Athysanella foeda* n. sp.

Resembling *incongrua*, but somewhat larger, styles of males much heavier, aedeagus with hook at tip and last ventral segment of female with very slender lateral margins and median tooth very short and broad. Length: Male, 4 mm.; female, 5 mm.

Vertex flat, margins rounding; apex of styles visible; spur on hind tibia of male not reaching middle of first segment of tarsi.

Color cinereous, vertex with faint indications of darker marks; elytra veins lighter; dorsum of abdomen with usual dark spots.

Genitalia. Pygofer broadly rounded; valve obtusely rounded; plates as wide as valve at base, sinuately narrowed to broadly rounded tips, mesally not touching, inner margins diverging; aedeagus in lateral view heavy, slightly curved dorsally, with hook at tip. Last ventral segment of female with lateral margins very long and slender, posterior margin deeply excavated with very broad, more or less trilobed median section.

Holotype male, allotype female, and 10 pairs of paratypes, Laramie, Wyo., June 23, 1935, R. H. and Jack Beamer. In Snow collection. Additional specimens at hand from Lyman, Wyo.

15. *Athysanella kanabana* n. sp.

Resembling *bifida*, but larger, female with posterior margin of last ventral segment without a median excavation, and style without divided apex, ending in fingerlike projection as in some of the *Amphipyga*. Length: Male, 3.5 mm.; female, 5 mm.

Vertex almost convex, margins rounding; styles visible; spur on hind tibia of male extending about two-thirds length of first tarsal segment.

Color cinereous; vertex may have cross dark dash from each ocelli, small black spot at apex, with pair of diverging dashes extending caudad and pair of rounded fuscous areas on disc. Elytra fuscous with light veins; dorsum of abdomen with six quite dark longitudinal stripes, middle four usually with light area in the dark on each segment.

Genitalia. Pygofer slightly narrowed on basal ventral corner and cut off on dorsal outer corner, giving it an angular appearance; valve about as wide as preceding segment, angular; plates wider at base than valve, usually not touching on median line, very short, apices almost truncate; styles with long fingerlike projection on inner margin; aedeagus broad in lateral view, widest at apex, with serrated protrusions on both sides. Last ventral segment of female almost twice as long as preceding, lateral margins sharply excavated for outer half its length, posterior margin rather progressively produced in three more or less definite undulations, the central much the largest.

Holotype male, allotype female, 29 male and 39 female paratypes, Kanab, Utah, August 9, 1936, R. H. Beamer; other paratypes as follows: 18 males and 44 females, Williamson Valley, Ariz., E. D. Ball; 6 males and 1 female, Kanab, Utah, E. D. Ball; numerous specimens, Stafford county, Kansas, salt marsh, R. H. Beamer and P. W. Oman, 1936; other specimens are at hand from the following localities: Wagonmound, N. Mex., Elmendorf, N. Mex., Santa Fe, N. Mex., St. Johns, Ariz., Fredonia, Ariz., Wilcox, Ariz. Types and paratypes in Snow Entomological Collection, paratypes in collection of E. D. Ball and the United States National Museum.

16. *Athysanella salsa* n. sp.

Resembling *utahna*, but usually with dark markings on dorsum, with male plates very short, scarcely surpassing apex of valve on inner margin and with truncate apices, male style with fingerlike process heavier and projecting beyond apex of style and aedeagus

without serrations on ventral margin and ending in a pronounced hook. Length: Male, 3 mm.; female, 4.5 mm.

Vertex flat, margins medium; styles usually visible; spur on hind tibia of male about two-thirds as long as first tarsal segment.

Color stramineous, sometimes tinged with green; elytra with veins faintly lighter; dorsum of abdomen with rows of spots faint.

Genitalia. Pygofer broad, almost rectangular. Valve of male obtusely rounded. Plates very short, scarcely extending beyond valve on inner margin, apices truncate. Styles projecting, finger-like process heavy, curved, extending beyond style. Aedeagus of medium length, in lateral view sides almost parallel, apex with hook on ventral margin. Last ventral segment of female with lateral lobes of posterior margin, narrow, sharply projecting, median portion very slightly produced, with a semblance of a notch either side middle.

Holotype male, allotype female and numerous male and female paratypes, St. John, Kan., September 11, 1936, R. H. Beamer; additional paratypes as follows: 15 pairs, Stafford county, Kansas, salt marsh, June 30, 1934, D. A. Wilbur; 2 males and 1 female, Lubbock, Tex., June 5, 1929, R. K. Fletcher; one pair, Clarendon Siding, Kan., July 26, 1891, C. F. Baker collection.

17. *Athysanella rostrata* n. sp.

Resembling *plana*, but usually without black spots on the margin of vertex, middle tooth on posterior margin of last ventral segment of female longer than laterals, and style with inner fingerlike projection very long and slender, with apex hooked out. Length: Male, 3.5 mm.; female, 5.25 mm.

Vertex flat, margins medium; styles visible externally; spur on hind tibia of male about two-thirds as long as first tarsal segment.

Color cinereous to tawny, often quite heavily marked with fuscous; vertex sometimes with a cross-dash opposite each ocellus, a pair of diverging dashes at apex; a pair of smoky boxlike spots on disc and a short dash on each side at base; pronotum more or less spotted and banded with brown; elytra brown with light veins; dorsum of abdomen with usual spotting, latter pair of longitudinal stripes much heavier.

Genitalia. Pygofer of male almost rectangular, corners rounded; valve about half as long as preceding segment, angular; plates wider at base than valve, very short, inner margin straight, outer converging, apex truncate; styles with apex bifid, inner fingerlike projec-

tion as long as style, bent out into a clawlike process at apex; aedeagus in lateral view of medium size, narrow at base, gradually enlarging to middle, then narrowing to sharp apex. Last ventral segment of female not as long as preceding, posterior margin divided into three strong teeth, the middle usually about twice as large as the outer.

Holotype male, allotype female and numerous paratypes, Perris, Cal., June 5, 1935, P. W. Oman. Types in United States National Museum.

18. *Athysanella utahna* Osb.

Athysanella utahna Osborn, Herbert, Annals Ent. Soc. Am., XXIII, p. 705, 1930.

Resembling *yumana*, but may be distinguished by the vertex being slightly longer than wide, by the green coloring with no spots, and by the much slenderer processes of the style. Length: Male, 3 mm.; female, 4.75 mm.

Vertex flat, margins sharp; style of male usually visible externally; spur on hind tibia of male about half as long as first tarsal segment.

Color yellowish-green, usually unmarked except spots on dorsum of abdomen, and those rather faint. Venter usually quite dark.

Genitalia. Pygofer broadly rounded; valve not half as long as preceding segment, angular; plates broader at base than valves, converging to rounded apices; style bifurcate at apex; excavation between points deep and evenly rounded; ventral process longest, quite slender; aedeagus in lateral view widest near middle, slightly serrate on ventral margin. Last ventral segment of female slightly longer than preceding, posterior margin deeply excavated with a short, blunt tooth at middle.

Lectoholotype male and lectoallotype female, Ephraim, Utah, July 20, 1914, E. D. Ball, described above, are here designated.

This is the common species in the salty or alkaline areas in the northwestern part of the United States. Specimens are at hand from Washington, Oregon, Idaho, Utah and Arizona.

19. *Athysanella supina* n. sp.

Resembling *Athysanella yumana* Osb., but crown flatter and margins sharper both from dorsal and lateral view; apex of style almost without excavation; elytra without dark longitudinal stripes. Length: Male, 3 mm.; female, 4.5 mm.

Crown flat, margins sharp in dorsal and lateral view; spine on hind tarsi of male about two-thirds as long as first tarsal segment.

General ground color yellowish-green; crown and abdomen often quite heavily embrowned; elytra usually without marks, sometimes veins lighter.

Genitalia. Pygofer of male almost rectangular; valve about as long as preceding segment; angular; plates narrower than valve at base, both margins converging to rounded apex; styles enlarged at tip with broad, inner fingerlike process, in lateral view like *fredonia*, in apical view almost straight, with tip slightly turned in; aedeagus in lateral view widest at middle, tip truncate; ventral margin serrate on middle third. Last ventral segment of female one-half longer than preceding segment, lateral margins strongly produced, posterior margin excavated almost to base with small tooth at middle.

Holotype male, allotype female, 12 females and 28 males, Boca Chica, Texas, May 30, 1933, P. W. Oman; 2 male paratypes, Cameron county, Texas, August 3, 1928, R. H. Beamer, and numerous specimens, Boca Chica, Texas, June 30, 1938, R. H. Beamer. Types in United States National Museum, paratypes in Snow Entomological Collection.

20. *Athysanella bifida* n. sp.

Resembling *foeda*, but much smaller, last ventral segment of female without lateral margins prolonged and inner prong of style very slender and sharp. Length: Male, 3 mm.; female, 4 mm.

Vertex flat, margins sharp; styles usually visible externally; spur on hind tibia of male about half as long as first tarsal segment.

Color cinereous, heavily marked with fuscous; vertex with two dashes at apex, indefinite boxlike spot on disc, with darker spot either side at base in a lighter area; pronotum with cross-row of spots anteriorly, and six longitudinal dark stripes back of these; elytra dark with light veins; dorsum of abdomen with six longitudinal dark stripes, inner pair on each side with a light inclusion on each segment.

Genitalia. Pygofer of medium size, margins slightly converging, apex almost truncate; valve broad, angular, rounded at apex; plates narrower at base than valve, sides slightly converging, apex almost truncate; style bifurcate at apex, outer prong concave next plate, inner branch narrow and sharp; aedeagus in lateral view of medium length, widest on outer third, ventral margin serrate. Last ventral segment of female barely longer than preceding, lateral margins evenly rounded, median third of posterior margin shallowly excavated.

Holotype male, allotype female, and numerous paratypes, Monument, Colo., August 19, 1936, R. H. Beamer; other paratypes as follows: 7 males and 9 females, Hartford, N. Mex., July 17, 1936, R. H. Beamer; 14 females and 15 males, Sisseton, S. Dak., July 23, 1935, P. W. Oman; 4 males and 12 females, Vayland, S. Dak., July 23, 1935, P. W. Oman; numerous males and females, Cheyenne, Wyo., July 20, 1935, P. W. Oman; 3 males and 1 female, Pine Bluff, Wyo., July 20, 1935, P. W. Oman; 5 males and 2 females, Wasta, S. Dak., July 27, 1935, P. W. Oman; 2 females, Wall, S. Dak., July 27, 1935, P. W. Oman; 1 female, Lusk, Wyo., July 21, 1935, P. W. Oman; 3 females, Fox Ridge, S. Dak., June 22, 1927, H. C. Severin; 1 male, Lake Oakwood, S. Dak., June 21, 1921, H. C. Severin.

Types and paratypes in Snow Entomological Collection; paratypes in United States National Museum and collection of E. D. Ball.

21. *Athysanella planata* n. sp.

Resembling *plana*, but distinctly smaller, without black spots on margin of vertex, style of male with smaller fingerlike process distinctly narrower, excavation in apex much deeper and last ventral segment of female with lateral processes longer, with median tooth larger. Length: Male, 2.75 mm.; female, 4 mm.

Vertex flat, margins rounded; styles usually visible externally; spur on hind tibia of male about two-thirds as long as first tarsal segment.

Color milky white, tinged with buff, almost unmarked, sometimes with few light markings on dorsum of abdomen.

Genitalia. Pygofer of male almost rectangular; valve slightly longer than preceding segment, obtusely angular; plates wider at base than valve, margins converging to rounded apices; style greatly enlarged on outer half, bifid, outer process in ventral view under a slip much narrower and longer than inner; aedeagus in lateral view widest at base, slowly narrowing to outer fourth where it rapidly narrows to hooked apex. Last ventral segment of female almost twice as long as preceding, posterior margin excavated almost to base, leaving very long, lateral processes with a fairly broad, angular median process.

Holotype male, allotype female, and numerous paratypes, Newberry Springs, Cal., July 30, 1936, D. R. Lindsay and R. H. Beamer. Types in Snow Entomological Collection.

22. *Athysanella yumana* Osb.

Athysanella yumana Osborn, Herbert, Annals Ent. Soc. Am., Vol. XXIII, p. 704, 1930.

This species is characterized by the vertex being wider than median length, by the dark markings on the vertex, elytra, and abdomen, and by the stout bifid apex of the style. Length: Male, 3 mm.; female, 4.75 mm.

Vertex flat, margins medium; style usually partially visible; spur on hind tibia of male about two-thirds as long as first tarsal segment.

Color cinereous, vertex with indication of cross dash from each ocellus and boxlike mark on disc; pronotum with cross-row of light brown spots; elytra with brown longitudinal stripes, at least partially present; abdominal stripes also at least indicated.

Genitalia. Pygofer rectangular, with outer corners broadly rounded; valve about two-thirds as long as preceding segment, angular; plates broader at base than valve, sides converging to rounded apices; style bifid at apex, both processes quite heavy, dorsal much longer; aedeagus in lateral view thickest on basal half, ventral margin serrate. Last ventral segment of female about twice as long as preceding, posterior margin deeply, angularly excavated, with a small median lobe.

The holotype and allotype were not designated in the original description. There is an empty pin in the Osborn collection carrying the label "type." However, no specimen was marked allotype, so a lectoholotype male and lectoallotype female, Yuma, Ariz., Herbert Osborn, are here designated. Types in collection of E. D. Ball, paratypes in Snow collection, the United States National Museum, and in Osborn collection.

The Subgenus *AMPHIPYGA* Osb.

Athysanella-like leaf hoppers, the males of which have a rounded pygofer and hind tibia without a spine at apex. The type of genus *Athysanella* (*Amphipyga*) *balli* Osb.

KEY TO THE SPECIES OF *AMPHIPYGA*

- | | | |
|----|---|----------------------------|
| 1. | Margin of vertex usually with at least a pair of round black spots..... | 10 |
| | Margin of vertex usually without a pair of round black spots..... | 2 |
| 2. | (1) Style with long fingerlike process on dorsal margin..... | 3 |
| | Style without long fingerlike process on dorsal margin..... | 4 |
| 3. | (2) Fingerlike dorsal process of style with knob at apex..... | <i>ardua</i> , p. 27 |
| | Fingerlike dorsal process of style tapering from base to apex..... | <i>playana</i> , p. 27 |
| 4. | (2) Plates with truncate apices..... | 5 |
| | Plates with rounded apices..... | 8 |
| 5. | (4) Aedeagus with pair of ventral diverging processes, arising at base..... | <i>rubicunda</i> , p. 28 |
| | Aedeagus without such processes..... | 6 |
| 6. | (5) Styles as long as plates..... | 7 |
| | Styles much shorter than plates..... | <i>nigrofascia</i> , p. 29 |

7. (6) Plates about as long as valve.....*turgida*, p. 36
 Plates much longer than valve.....*skullana*, p. 28
8. (4) Aedeagus in lateral view with serrations on ventral margin; plates with dark spot at apices*triodana*, p. 30
 Aedeagus without serrations on ventral margin or black spot at apex of plates, 9
9. (8) Aedeagus very large at base, tapered to tip; ventral point of style short, curved*nimbata*, p. 30
 Aedeagus small, not tapered until outer fourth; ventral process of style long, straight, with the ventral point forms an acute angled notch; pygofer with a notched process at apex*tezana*, p. 31
10. (1) Apical third of style bifid..... 11
 Apical third of style not bifid..... 14
11. (10) Ventral point of foot of style rounded.....*anzana*, p. 32
 Ventral point of foot of style angular..... 12
12. (11) Longitudinal brown vittae of elytra broad and dark; apex of dorsal point of style slightly enlarged*balli*, p. 32
 Longitudinal vittae of elytra quite light; dorsal point of style not enlarged.. 13
13. (12) Three markings on margin of vertex, small middle one often with two diverging backward pointing dashes; dorsal point of style almost twice as long as ventral*stylata*, p. 33
 Two markings on margin of vertex, large, round; dorsal point of style barely longer than ventral*reticulata*, p. 33
14. (10) Pygofer with an apical, sharp, black spine..... 15
 Pygofer without such a spine..... 19
15. (14) Styles scarcely reaching apex of plates..... 16
 Styles protruding beyond plates..... 18
16. (15) Apices of plates evenly rounded; outer third of style oval.....*aridella*, p. 34
 Apices of plates with a distinct angle on outer dorsal corner; outer third of style with sides almost parallel, apices almost truncate..... 17
17. (16) Pygofer avicephaliform; aedeagus enlarged at apex.....*attenuata*, p. 37
 Pygofer not avicephaliform; aedeagus not enlarged at tip.....*obesa*, p. 34
18. (15) Smaller species ♂ 2.25 mm.; plates almost truncate with long dorsal corner; styles clavate*minor*, p. 35
 Larger species ♂ 2.75 mm.; darker; aedeagus enlarged on outer half*minor* var. *major*, p. 36
19. (14) Plates not reaching beyond valve.....*turgida*, p. 36
 Plates reaching beyond valve..... 20
20. (19) Apex of style with hook on dorsal margin.....*hamata*, p. 37
 Style without hook 21
21. (20) Largest species in genus ♀ 5, ♂ 3.25; pygofer narrowed with embrowned projection on ventral margin; last ventral segment of ♀ almost straight*attenuata* Bk., p. 37
 Pygofer hook without projection, much smaller species..... 22
22. (21) Aedeagus with large hump on ventral margin near middle, posterior margin of last ventral segment with spade-shaped projection occupying middle third*wilburi*, p. 38
 Aedeagus without such a hump..... 23
23. (22) Aedeagus with serrations on dorsal margin; plates usually almost contiguous at base*occidentalis*, p. 39
 Aedeagus without serrations on dorsal margin..... 24
24. (23) Outer half of styles roundly oval; aedeagus with coarse serrations on ventral margin; posterior margin of last ventral segment of female almost straight*acuticauda*, p. 40
 Outer half of styles with sides almost parallel-margined; aedeagus with fine serrations on ventral margin; posterior margin of last ventral segment of ♀ produced 25
25. (24) Plates with apices almost truncate, at least half as wide as at base; posterior margin of last ventral segment of ♀ produced over two-thirds its width with a shallow excavation in its middle.....*modesta*, p. 40
 Plates narrowed to rounded tips, not one-third as wide as base; posterior margin of last ventral segment of ♀ slightly produced over broad area..*kansana*, p. 41

23. *Athysanella (Amphipyga) ardua* n. sp.

Resembling *teres* Ball and Beamer, but easily separated from it by the enlarged apex of the fingerlike process of style and by the plates being much longer than the valve. Length: Male, 3 mm.; female, 4.75 mm.

Vertex flat, margins fairly sharp; enlarged apex of fingerlike process of style usually visible externally.

Color cinereous, elytra sometimes with lighter longitudinal stripes; abdomen with usual rows of small brown spots.

Genitalia. Pygofer of male almost quadrangular, outer corners rounded; valve about as long as preceding segment, angular; plates broader than valve at base and but slightly larger, separated on inner margin; apices bluntly rounded; style enlarged on outer half with very long knobbed inner fingerlike process; aedeagus in lateral view stout, widest at apex with heavy serrations on ventral apical margin. Last ventral segment of female longer than preceding, with lateral angles rounded to broad median projection of posterior margin.

Holotype male, allotype female, 10 female and 14 male paratypes, Lamar, Colo., August 20, 1936, R. H. Beamer; 2 male paratypes, Pueblo, Colo., E. D. Ball; 2 male and 3 female paratypes, Lamar, Colo., July 10, 1899, and 1 male, Snyder, Colo., August 2, 1899; 7 female and 11 male paratypes, Las Animas, Colo., August 20, 1936, R. H. Beamer. Other specimens at hand from Alamosa, Monte Vista, and Garden of the Gods, Colorado. Types and paratypes in Snow Entomological Collection; paratypes in collection of E. D. Ball and Colorado State College.

24. *Athysanella (Amphipyga) playana* n. sp.

Resembling *ardua* B. & B., but with fingerlike processes of styles converging instead of knobbed, with aedeagus longer and more slender without the large serrations at apex, with shorter plates scarcely exceeding valve. Length: Male, 3 mm.; female, 4.5 mm.

Vertex flat, margins quite rounded; fingerlike process of style usually visible externally.

Color varies from stramineous to cinereous with dark markings; vertex usually light; pronotum flecked with brown; elytra and dorsum of abdomen with quite dark brown longitudinal stripes.

Genitalia. Pygofers broadly rounded. Valve obtusely angled; plates widely separated, about as wide as valve at base, scarcely reaching beyond apex of valve, roundly blunt; styles with long

narrowing fingerlike process on inner margin; aedeagus long and slender, scarcely curved, apex with dorsal protuberance and apical bulging.

Holotype male, allotype female, 1 female paratype, September 6, 1936, and 2 males and 5 females, June 11, 1936, Wilcox, Ariz., E. D. Ball; 17 pairs of paratypes, Cochise, Ariz., August 24, 1935, R. H. Beamer. Holotype, allotype and paratypes in Ball collection, paratypes in Snow Entomological Collection.

25. *Athysanella (Amphipyga) rubicunda* n. sp.

Resembling the light form of *nigrafascia* DeL., but easily separated from it by the pink color, by the excavated apices of male plates, the long, diverging, ventral processes of aedeagus and the longer process on the last ventral segment of the female. Length: Male, 3 mm.; female, 3.5 mm.

Structure. Vertex bluntly angular, slightly wider between eyes than median length. Elytra short exposing about five abdominal segments.

Color. Stramineous tinged with pink, process of last ventral segment of female darkened.

Genitalia. Last ventral segment of female with lateral margins rounding to very long, quadrangular median process occupying one-third width of segment. Male valve slightly more than right angle; plates about as wide as valve at base, lateral margins sinuately converging to concave apices, inner margins slightly diverging near apex. Aedeagus almost a straight tube with a pair of ventral processes arising at base, diverging, almost as long as shaft. These processes are unusual in the genus.

Holotype male, allotype female, 1 male and 1 female paratype, Phillips county, Kansas, July 8, 1925, R. H. Beamer; other paratypes; 4 females and 1 male, Portales, N. Mex., July 16, 1936, R. H. Beamer; 5 males and 2 females, Sturgis, S. Dak., July 22, 1935, P. W. Oman; 3 males, Colorado, No. 1593, C. F. Baker. Types in the Snow Entomological Collection and paratypes in the U. S. National Museum.

26. *Athysanella (Amphipyga) skullana* n. sp.

Resembling *wilburi*, but apices of plates of male truncate instead of rounded, apices of styles more rectangular than oval, serrated protrusion on ventral margin of aedeagus on outer third instead of near middle and last ventral segment of female with median pro-

trusion angular instead of rectangular. Length: Male, 3 mm.; female, 4 mm.

Vertex more or less rounded, margins rounding, color cinereous with more or less darker markings; vertex often with more or less indefinite dark marks; pronotum with usual cross row of spots; clytra from semihyaline with lighter veins to dark brown longitudinal bands; dorsum of abdomen with usual rows of brown spots.

Genitalia. Pygofer of male very slightly narrowed to rounded apex with peculiar angled process on inner margin; valve about as long as preceding segment, obtusely angled; plates wider at base than valve, sides slightly narrowed to truncate apices with rounded corners; style enlarged on outer half, widest just before apex, outer margin longest; aedeagus in lateral view almost straight, slightly narrowed at middle, with a peculiar, serrated protrusion on outer fourth on ventral margin. Last ventral segment of female longer than preceding, lateral margin rounding, posterior margin with middle third protruded in form of triangle.

Holotype male, allotype female and 4 female paratypes, Skull Valley, Arizona, April 24, 1904, E. D. Ball. In collection of E. D. Ball.

27. *Athysanella (Amphipyga) nigrofascia* DeLong and Davidson

Amphipyga nigrofascia DeLong and Davidson, Jr., N. Y., Ent. Soc., No. 2, Vol. XLII, p. 222, 1934.

This species was described from two males from Lodi, Cal. The female is here described for the first time.

Length, 3.75 mm. Colored as the male. Last ventral segment more than twice as long as preceding, lateral margins rounding to a very long, black, rectangular, median projection, occupying about one-third posterior margin.

Allotype female described above, Antioch, Cal., July 30, 1935, R. H. Beamer.

This species is quite variable in color. Out of the 73 females and 70 males taken at the above place and time, about 40 each, males and females, were typically colored, the remainder lacking any dorsal black markings, the projection of the last ventral segment of the female retaining the only dark coloring. National museum material collected in California in 1935 by P. W. Oman showed a variation from almost entirely black individuals to entirely light ones. Male internal genitalia were identical in both forms.

Allotype in Snow Entomological Collection.

28. *Athysanella (Amphipyga) triodana* n. sp.

Resembles *occidentalis* (Baker), but lacks most of the black markings; the last ventral segment of female is much broader, more nearly truncate and with lateral margins sharply excavated; pygofer broadly rounded and the styles slender and evenly tapered from lateral projection instead of spatulate. Length: Male, 2.75 mm.; female, 4 mm.

Vertex flat, margins rather rounded.

Color from stramineous to cinereous, usually not much color except usual spots on dorsum of abdomen. Some specimens have frontal ares quite black, giving a darkened appearance to the whole face.

Genitalia. Last ventral segment of female not quite twice as long as wide, lateral margins narrowly and sharply excavated to a very broad and long median projection, which is almost truncate. Male pygofer slightly narrowed apically; valve obtusely angled; plates as broad as valve at base, lateral margins sinuately rounded to semisharp apices, mesal margin diverging on outer half; styles on outer half long and slender, gradually tapering to sharp apices.

Holotype male, allotype female, 2 female and 20 male paratypes, Baboquivari Mts., Arizona, July 19, 1932, R. H. Beamer; other paratypes as follows: 10 pairs, Baboquivari Mts., Arizona, August 29, 1931, E. D. Ball.

Holotype, allotype and paratypes in Snow Entomological Collection. Paratypes in Ball collection.

29. *Athysanella (Amphipyga) nimbata* n. sp.

Resembling *texana*, but much larger, face usually solid black and without comb on pygofer. Length: Male, 3.25 mm.; female, 4 mm.

Vertex flat or excavated, margins sharp, style not visible externally.

Color yellowish-green; vertex often with a fuscous dash at apex; dorsum of abdomen with usual rows of fuscous spots; venter usually black, especially the entire face.

Genitalia. Posterior margin last ventral segment of female almost truncate, slightly protruding at middle; male valve broadly rounded; plates about as wide at base as valve, sinuately narrowed on outer margin to rounded apices; aedeagus short, in dorsoventral view very broad at base tapering to rather short apex. Pygofer broadly rounded.

Holotype male, allotype female, 7 long winged, 1 short winged, female paratypes, Baboquivari Mts., Arizona, August 29, 1931, E. D. Ball; other paratypes as follows: 4 pairs, Patagonia, Ariz., June 24, 1933, R. H. Beamer; 2 females and 10 males, Patagonia, Ariz., June 24, 1933, P. W. Oman; 4 pairs, Tucson, Ariz., September 1, 1929, E. D. Ball. Additional specimens are at hand from Chiricahua Mts., Arizona, Santa Rita Mts., Arizona, and Tombstone, Ariz.

Holotype and allotype in collection of E. D. Ball, paratypes in Snow Entomological Collection and that of United States National Museum.

30. *Athysanella* (*Amphipyga*) *texana* (Osborne)

Pectinapyga texana Osborn, H. Ann. Ent. Soc. Am., P. 697, 1930.

Gladionura aridicola Osborn, H. Ann. Ent. Soc. Am., P. 707, 1930.

About the size of *occidentalis*, but with vertex flat, margins flat and lacking round, black spots. Length, 2-4 mm.

Vertex flat to excavated, margins sharp; style not usually visible externally.

Color cinereous, varying from almost without dark marks to quite heavily marked specimens.

Genitalia. Pygofer of male narrowed to a triangular shape with apex rounded, apex containing a small comblike plate; valve shorter than preceding segment, angular; plates wider at base than valve, strongly constricted on outer margin near middle, apices rounded; style enlarged on outer half with a deep and sharp angular excavation on outer margin, apex sharp. Last ventral segment of female longer than preceding, posterior margin shallowly excavated either side a broad, slightly protruding middle portion.

Types examined. Specimens at hand from Kansas, Oklahoma and Texas. The Kansas specimens are quite consistently larger than the Texas forms.

The presence of the comblike structure does not seem sufficient for generic rank, especially when we find species like *nimbata* and *triodana* which are so like *texana*, but do not have this structure. The genus *Pectinapyga* is therefore placed in the subgenus *Amphipyga*.

The female Holotype of *Gladionura aridicola* Osb. was examined and is unquestionably a specimen of *texana*, it therefore becomes a synonym of this species. The male allotype of *Gladionura aridicola* is a specimen of *Athysanella yumana* Osb.

31. *Athysanella (Amphipyga) anzana* n. sp.

Resembling *playana*, but smaller, plates of male longer, finger of style shorter, more slender, with a distinct excavation between it and apex of shaft, and aedeagus much shorter with larger, serrated apex. Length: Male, 3 mm.; female, 4 mm.

Vertex flat, margins rather acute, styles of male usually exposed.

Color cinereous, usually with dark marks; vertex with two small black spots on margin either side of apex and two short diverging dashes just back of apex; pronotum with a semblance of cross row of spots; elytra and abdomen with usual longitudinal dark stripes.

Genitalia. Pygofers broadly rounded. Valve angular; plates about as wide as valve at base, very short, scarcely reaching beyond valve, slightly narrowed to truncate apices; styles with long fingerlike process on inner margin. Aedeagus short, broadening to rounded tip, ventrally serrate on outer third. Last ventral segment of female with posterior margin slightly produced.

Holotype male, allotype female, 5 males and 1 female paratypes, Anza, Cal., August 6, 1932, J. D. and R. H. Beamer. Types in Snow Entomological Collection.

32. *Athysanella (Amphipyga) balli* Osb.

Amphipyga balli Osborn, Herbert, Bull. 14, Ohio Biol. Survey, 1928, p. 289.

A beautiful species with its black spots on margin of vertex, its dark oblique vittae of elytra, and characterized by the fingerlike projection on inner margin of style and widely separated triangular plates, with very short inner margins.

Genitalia. Pygofer of male almost rectangular; valve about as long as preceding segment, angular; plates broader at base than valve, short, about as long as valve with truncate apices; style enlarged on outer half, angularly excavated on outer fourth leaving a fingerlike projection. Last ventral segment of female about as long as preceding, lateral margins rounded into short processes, posterior margin slightly excavated to rounding, slightly produced median portion, sometimes a slight indication of notch either side middle.

Holotype female, Marietta, Ohio, September 13, 1905; allotype male, Columbus, Ohio, July 22, so labeled in Osborn collection are here designated.* Other specimens are at hand from Kansas and Iowa. -

* Professor Osborn in his revision of this group of insects in the *Annals*, 1930, is often indefinite and failed to follow a uniform practice in his designation of types. Designations will be made and his intent followed wherever possible.

33. *Athysanella (Amphipyga) stylata* Osb.

Amphipyga stylata Osborn, Herbert, Annals Ent. Soc. Am., Vol. XXIII, p. 694, 1930.

Resembling *reticulata* Osb. very closely, but may be separated from it by the more rounded apices of the male plates, by the longer fingerlike process of the style, by the shorter aedeagus, with one point at apex, and by the posterior margin of last ventral segment of female being convex.

Vertex flat to convex, margins rather sharp; styles of males usually exposed.

Color cinereous with darker markings; vertex with two or three black spots on margin, usually a pair of dashes just back of apex and often a pair of comma-shaped marks at base; veins of elytra often light with dark longitudinal stripes more or less in evidence.

Genitalia. Pygofer of male broadly rounded. Valve obtusely rounded; plates about as broad as valve at base, very slightly narrowed on outer margin, inner margin broadly separated, diverging to rounded apices; styles with right-angled notch near outer third, inner fingerlike process about one-third longer than width of shaft at notch; aedeagus in lateral view widened and ventral margin serrate on outer half with small tooth at apex. Last ventral segment of female with lateral margins slightly produced, posterior margin evenly rounded from these small projections.

Holotype female, allotype male, Grand Junction, Colo., H. Osborn, so labeled in Osborn collection are here designated. Numerous specimens of both sexes are at hand from Palisades, Colo., August 16, 1936, R. H. Beamer.

34. *Athysanella (Amphipyga) reticulata* Osb.

Amphipyga reticulata Osborn, Herbert, Annals Ent. Soc. Am., Vol. XXIII, p. 691, 1930.

Resembling *balli* Osb., but without heavy, dark markings; is larger, aedeagus longer with larger ventral serrations, male plates longer and sharper and posterior margin of last ventral segment of female is excavated instead of produced. Length: Female, 4 mm.

Vertex hardly flat, margins rounded.

Color cinereous; vertex with two round, black spots; elytra with veins lighter, with tendency to brown longitudinal stripes; abdomen with usual spotting.

Genitalia. Male pygofer broadly rounded. Valve obtusely angled; plates as broad as valve at base, mesal margins separated at base, sharply diverging to sharp apices; styles with right-angled notch at apex, fingerlike inner process about as long as width of shaft at notch. Aedeagus in lateral view with sides almost parallel, ventral

margin roughly serrate, apex apparently with two teeth. Last ventral segment of female with lateral margins produced, posterior margin excavated with slightly produced median tooth.

Although the original description says "Described from two females from the collection of E. D. Ball, Elsinore, Utah, April 22, 1906," there are three females in Doctor Ball's collection from Elsinore, Utah, 2 with paratype labels and one with the printed word "Type." This latter specimen is here designated *holotype*. The male, Monroe, Utah, July 25, 1906, described above, does not have black spots of vertex, so it is not here designated. Types in Ball collection.

35. *Athysanella (Amphipyga) aridella* Osb.

Amphipyga aridella Osborn, Herbert, Annals Ent. Soc. Am., D. c., 1930, p. 693.
Amphipyga californica Osborn, Herbert, Annals Ent. Soc. Am., Dec., 1930, p. 696.

This species resembles *occidentalis*, but is usually more reddish in color and characterized by a distinct tooth on the outer margin of an otherwise rather blunt pygofer. Length, 1.75-2.25 mm.

Vertex not flat, margins rounded; style of male not exposed.

Color stramineous with a reddish tinge with two large, round, black spots on margin of vertex, and sometimes a tiny apical spot.

Genitalia. Pygofer of male narrowed to blunt apex with a sharp tooth on ventral corner; valve about as long as preceding segment, obtusely rounded; plates broader than valve at base, sides converging to rounded apices; style enlarged on outer half, clavate with rounded apex; aedeagus in lateral view with sides almost parallel, curved dorsally, ending in a light hook, in ventral view enlarged on outer half, margin serrated, apex sharp. Last ventral segment of female about as long as preceding, lateral margins rounded, posterior margin slightly excavated from lateral lobes to a median lobe of about same length.

Holotype female and lectoallotype male, Tucson, Ariz., Herbert Osborn, are here designated.

Although no types were designated in the original description, a female from Tucson bore a holotype label. Another female from Mojave, Cal., bore the allotype label. Therefore, some error in placing this last label was made. A paratype male from the Osborn collection is therefore chosen for the lectoallotype.

36. *Athysanella (Amphipyga) obesa* n. sp.

Resembling *aridella* Osb., but much larger, male plates much sharper, styles more slender, and last ventral segment of female with lateral margins rounded to slightly excavated posterior margin. Length: Male, 3 mm.; female, 4 mm.

Vertex scarcely flat, margins rounded; styles not exposed.

Color cinereous; two black spots on margin of vertex; veins of elytra lighter; usual spotting on dorsum of abdomen.

Genitalia. Pygofer of male large, narrowed to blunt apices with large tooth on ventral corner; valve shorter than preceding segment, roundly obtuse; plates wider at base than valve, inner margins touching at base, rounding to rather sharp apices with a fuscous spot; style clavate on outer half with small protuberance on outside, apex rounded; aedeagus in lateral view slightly wider near middle, ending in sharp beaklike tip, in dorsoventral view flaring on outer half, with serrate edges. Last ventral segment of female slightly shorter than preceding, lateral margins broadly rounded, shallowly excavated posterior margin.

Holotype male, allotype female, and 2 male paratypes, Calhan, Colo., August 19, 1936, R. H. Beamer; other paratypes, 1 male, Mustang Mt., Arizona, June 12, 1933; 2 females and 1 male, Sander-son, Tex., June 5, 1933, P. W. Oman; 1 female, Garden of the Gods, Colorado, August 19, 1936; 1 male, Sturgis, S. Dak., July 22, 1935, P. W. Oman; 3 males and 1 female, Mustang Mt., Arizona, June 12, 1933, P. W. Oman. Types in Snow Entomological Collection, paratypes in United States National Museum and collection of E. D. Ball.

37. *Athysanella (Amphipyga) minor* n. sp.

Resembling in general appearance *occidentalis*, and in genitalia *aridella*. It may be separated from the first by the large tooth on the posteroventral corner of pygofer and from the latter by the broad, angularly truncated plates with the protruding styles. Length: Female, 3 mm.; male, 2.25 mm.

Vertex obtusely angled, wider than pronotum, slightly wider than median length.

Color. Generally dark. Vertex with apical spot and rectangular one either side black; pair of small triangles back of apical spot and a pair of median longitudinal, almost parallel, stripes reaching base with short dash outside these and a longer one next eyes. Pronotum with an irregular row of black spots on anterior margin. Elytra dark with veins lighter. Abdomen dark with lighter longitudinal vitae and rows of spots.

Genitalia. Last ventral segment of female slightly narrower than preceding; posterior margin very slightly trilobed. Male valve obtusely rounded; plates about as wide at base as valve, slightly narrowed to truncated apices with outer margins longer; styles apically

enlarged, slightly protruding. Aedeagus slightly curved dorsally, in dorsoventral view enlarged on outer third to form a diamond-shaped tip. Pygofers more than twice as long as wide, posteroventral corner with a large tooth.

Holotype male, allotype female, 20 female and 25 male paratypes, Campo, Cal., August 10, 1935, R. H. Beamer.

37a. *Athysanella (Amphipyga) minor* var. *major* n. var.

Like *minor* Ball and Beamer, but much larger, with aedeagus enlarged on outer half, sharper pointed, with tooth of pygofer more pronounced and with apices of plates slightly excavated and outer corner more pronounced. Length: Female, 3.75 mm.; male, 2.75 mm.

Holotype male, allotype female, 4 male and 8 female paratypes, Newton, Cal., June 1, 1935, P. W. Oman.

38. *Athysanella (Amphipyga) turgida* n. sp.

Resembling *playana*, but vertex usually with black spots on margin; style curved dorsad at apex and aedeagus much enlarged at apex. Length: Male, 2.75 mm.; female, 4 mm.

Vertex flat, margins rounded; styles exposed externally.

Color cinereous, usually with three black spots on margin of vertex and disc more or less infuscated; pronotum and elytra with or without dark markings; dorsum of abdomen with usual dark spots.

Genitalia. Last ventral segment of female more than twice as wide as preceding, lateral margins definitely extended, posterior margin roundly excavated to form a convex mesal portion slightly shorter than lateral corners. Male valve angular, plates very short, not exceeding valve, about as broad at base as valve, rounded to blunt apices, widely separated on mesal margin. Style long, swollen on outer third, narrowed to slender curving tip. Aedeagus in lateral view gradually broadened to truncate tip.

Holotype male, allotype female, 5 male and 6 female paratypes, Boulder Dam, Ariz., September 16, 1934, E. D. Ball; other paratypes, 7 males, 10 females, Yuma, Ariz., March 30, 1932, E. D. Ball; 3 females, 12 males, San Jacinto Mts., California, east of Pinon Flats, June 4, 1935, P. W. Oman; 2 females, Alamo, Ariz., August 14, 1935; 2 males and 3 females, Sentinel, Ariz., August 24, 1938, R. H. Beamer. Types and paratypes in collection of E. D. Ball, paratypes in United States National Museum and in Snow Entomological Collection.

39. *Athysanella (Amphipyga) hamata* n. sp.

Resembling *acuticauda*, but male pygofer about half as wide, plates sinuate on inner margin, styles with apical outward turning hook and last ventral segment of female with lateral angles rounding to a broad curved median projection. Length: Male, 2.75 mm.; female, 4 mm.

Vertex flat, margins rounded; style not exposed.

Color cinereous to yellowish-green; usually with two large and one small black spot on margin of vertex; elytra with veins usually lighter, with or without dark markings; abdomen usually with customary dark spotting.

Genitalia. Pygofer narrowed apically to about one-third median width. Male valve obtusely angulate, plates as broad at base as valve, concavely narrowed on both margins to rather sharp apices. Styles long, swollen on outer third, sharply narrowed to outward curving hook at apex. Aedeagus almost straight in lateral view, much thicker at base than at apex, ventral serrations fine.

Holotype male, allotype female, 7 male and 11 female paratypes, Santa Fe, N. Mex., July 20, 1936, R. H. Beamer; one paratype, Antonio, Colo., August 5, 1900; 4 male and 7 female paratypes, Laramie, Wyo., July 30, 1935, P. W. Oman. Types and paratypes in Snow Entomological Collection. Paratypes in Agricultural College Collection, Fort Collins, Colo., and United States National Museum. A nice series of what is apparently this species are at hand from Pecos, N. Mex., P. W. Oman. They lack the round, black spots on the margin of the vertex and are therefore not included in the paratype series.

40. *Athysanella (Amphipyga) attenuata* Baker

Athysanella attenuata Baker, C. F., Psyche, 1898, p. 188.

Amphipyga alta Osborn, Herbert, Annals Ent. Soc. Am., Dec., 1930, p. 693.

Athysanella extrusa Osborn, Herbert, Annals Ent. Soc. Am., Dec., 1930, p. 703.

This is one of the largest species in this genus. Described from four males and numerous females from Colorado.

The species is easily characterized by the avicephaliform pygofer and its large size. Length: Male, 4 mm.; female, 5 mm.

Vertex flat, margins angular; styles hidden.

Color cinereous marked with fuscous; vertex with or without two or three black spots; veins of elytra usually lighter; sometimes with brown longitudinal stripes; abdomen with usual spots.

Genitalia. Pygofer of male narrowed to an avicephaliform apex with beak on ventral margin; valve almost twice as long as preced-

ing segment, angular; plates wider at base than valve, inner margins almost touching at base, rounded to outer margin to form sharp apices, characteristic dark spot on inner margin one-third distance from apex; style clavate, process distinct on outer margin just before club, apex rather slender; aedeagus in lateral view large, widest at tip with a serrated flangelike projection on all four margins on outer fourth. The last ventral segment of female considerably longer than preceding, lateral margins excavate to rounded corners, posterior margin very slightly produced throughout about two-thirds middle portion.

Lectoholotype brachypterous female, Fort Collins, Colo., August 18, 1935, C. F. Baker (Colorado, 1600), bearing Baker's red determination label. Lectoallotype, brachypterous male, Fort Collins, Colo., August 6, 1895, C. F. Baker (Colorado, 1589), are here designated. Types in United States National Museum.

This is one of the commonest species throughout its range. Specimens have been examined from Kansas, Colorado, New Mexico, Texas, Oklahoma, Arizona, Utah, Montana, and Wyoming.

Types of the species placed in synonymy have been examined. Those of *alto* Osb. are specimens of *attenuata* that lack the black spots, a common occurrence. In *extrusa* the females are all *attenuata* and the males another species. Since a female was designated and labeled holotype, the name must fall. The original difficulty came about through the incorrect association of a male for *attenuata*, thus dislocating several forms.

41. *Athysanella (Amphipyga) wilburi* n. sp.

Resembling in general size and coloring *acuticauda* Bk., from which it may be separated by the long median projection on the posterior margin of the last ventral segment of the female and by the large serrated median hump on the ventral margin of the aedeagus. Length: Female, 3.75 mm.; male, 2.75 mm.

Vertex roundly angled, slightly longer at middle than width between eyes. Males without spines on hind tibiae.

Color. General color stramineous. Vertex with small apical spot and larger rectangular one either side, black. Veins of elytra lighter. Abdomen flecked with darker spots.

Genitalia. Last ventral segment of female with lateral angles rounded to a very long quadrangular median process, about as long as width of segment. Median portion of segment often darkened. Male valve roundly obtuse. Plates about as wide at base as valve, sinuately narrowed to rounded apices, black spot apically outside

middle. Aedeagus in lateral view slightly curved dorsally with large serrated median hump on ventral margin.

Holotype male, allotype female, and numerous male and female paratypes, Medora, Kan., June 25, 1936, R. H. Beamer and P. W. Oman. Additional paratypes as follows: 1 female, McPherson county, Kansas, June 28, 1923; 1 female, Dodge City, Kan., July 2, 1935; 10 pairs, Sandhills, Medora, Kan., D. A. Wilbur.

This species is named in honor of Prof. D. A. Wilbur, Manhattan, Kan., who has collected a great many interesting Kansas Cicadellids.

42. *Athysanella (Amphipyga) occidentalis* Baker

Athysanella occidentalis Baker, C. F., Psyche, March, 1898, p. 186.

Athysanella minuta Baker, C. F., Psyche, March, 1898, p. 189.

Resembling *acuticauda*, but smaller, plates of male usually contiguous at base, aedeagus serrated on dorsal margin and median lobe of last ventral segment of female extending beyond laterals. Length: Male, 2 mm.; female, 3 mm.

Vertex flat, margins rounding, style hidden.

Color tawny gray; vertex with two large, black spots and usually a smaller apical one; elytra with veins lighter; usual dark spots on dorsum of abdomen.

Genitalia. Pygofer of male narrowed to roundly sharp valve about one-third longer than preceding segment, obtusely rounded; plates wider than valve at base, contiguous at base on inner margin, outer margin strongly excavated on outer half, inner margin rounding to rather sharp point; style enlarged on outer half with earlike projection on outer margin near middle, apex rounded; aedeagus in lateral view widest near outer third, serrate on dorsal margin, ventral margin rounding at tip to sharp apex. Last ventral segment of female of about same length as preceding, lateral margins excavated to rounded corners, posterior margin with middle portion roundly produced, always longer than lateral corners.

Lectoholotype brachypterous female, Fort Collins, Colo., June, C. F. Baker (Colorado 1638), bearing Baker's red determination label. Allotype, brachypterous male, Fort Collins, Colo., July 19, 1935, P. W. Oman. Types in United States National Museum.

Specimens have been examined from Colorado, South Dakota, Kansas, New Mexico, Arizona, Oregon, Utah, Wyoming, Washington, British Columbia, and Montana.

43. *Athysanella (Amphipyga) acuticauda* Baker

Athysanella acuticauda Baker, C. F., Psyche, March 1898, p. 187.

Resembling *occidentalis*, but much larger, plates widely separated at base; aedeagus serrated on ventral margin and last ventral segment of female with posterior margin almost straight across. Length: Male, 3 mm.; female, 4 mm.

Vertex flat, margins rounded, plates open, styles more or less visible.

Color dark yellowish-gray, heavily marked with fuscous. Vertex with two large black spots on margin and smaller one at apex; disk often embrowned; elytra dark with light veins; dorsum of abdomen with usual dark marks.

Genitalia. Pygofer of male narrowed on ventral margin to blunt corner on inner margin (view under a slip); valve longer than preceding segment, obtusely rounded; plates broader at base than valve, separated by about half their width at tip of valve, inner margin angled to sharp apices, outer margin slightly excavated on outer third; style enlarged on outer half, clavate, apex oval; aedeagus in lateral view curved dorsally, widest at base with a few large serrations on ventral margin. Last ventral segment of female considerably longer than preceding, lateral margins slightly excavated to fairly angular corners, posterior margin slightly excavated to almost flat middle portion.

Lectoholotype female, brachypterous, Campton's, Colorado, altitude, 7,000 ft., July 21, 1895, C. F. Baker (Colorado, 1580), bearing Baker's red determination label. Lectoallotype, brachypterous male, Algonquin, Ill., August 1, 1895. In United States National Museum. Specimens have been examined from Maine, New Hampshire, Michigan, Wisconsin, Colorado, New Mexico, Utah, South Dakota, North Dakota, Minnesota, and Wyoming.

44. *Athysanella (Amphipyga) modesta* n. sp.

Resembling *occidentalis* Baker, but with lateral margins of last ventral segment of female sharply emarginate, leaving a very broad and long median projection which is slightly excavated mesally, male plates much shorter with broad apices and pygofer of male longer and more slender. Length: Male, 2.75 mm.; female, 3 mm.

Vertex flat, margins rounded; style usually hidden.

Color cinereous, heavily embrowned; vertex with two large black spots on margin, smaller one at apex, disc more or less embrowned; anterior half of pronotum heavily spotted, remainder embrowned;

elytra brown with veins lighter; abdomen with usual brown spots and stripes.

Genitalia. Last ventral segment of female about a third longer than wide, lateral margins sharply emarginate to a very long and broad median projection shallowly excavated mesally on posterior margin. Male valve broadly rounded, almost as long as wide; plates quite short, about as wide at base as valve, slightly narrowed to broad, almost truncate tips. Pygofer of male long and narrow, apices about one-fourth basal width.

Holotype male, allotype female, and 14 pairs of paratypes, Lockwood, Cal., July 24, 1935, R. H. Beamer. Types in Snow Entomological Collection.

45. *Athysanella (Amphipyga) kansana* n. sp.

Resembling *acuticauda*, but plates of male more rounded at apex with a slight excavation on inner margin, separated about half as far as in *acuticauda*, apical half of style not enlarged into clubs and last ventral segment of female with median lobe distinctly longer than laterals. Length: Male, 3.5 mm.; female, 4.5 mm.

Vertex flat, margins rounding, styles usually hidden.

Color cinereous, heavily embrowned; vertex with two black spots on margin and a smaller one on apex, disc with embrowned area near base and pair of angled dashes at each side; elytra dark with veins lighter; abdomen with usual dark areas.

Genitalia. Pygofer of male narrowed to rounded apex; valve about as long as preceding segment, angular; plates wider at base than valve, separated by a distance about equal to width of dark area of tips, rapidly narrowed to narrow apices, inner margin slightly excavated; aedeagus in lateral view tapering from base to apex, slightly curved dorsally with rather fine serrations on ventral margin; style in lateral view with long tooth on outer margin near middle, tapered from there to rather blunt apex. Last ventral segment of female longer than preceding, lateral margins excavated for about half their length to rounded lateral corners, posterior margin slightly excavated from lateral lobes to a distinct, broader median lobe.

Holotype male, allotype female, and numerous paratypes, Nickerson, Kan., June 26, 1936, R. H. Beamer; other paratypes as follows: 10 males, 5 females, Sterling, Kan., June 26, 1936, P. W. Oman. Types and paratypes in Snow Entomological Collection, paratypes in United States National Museum and collection of E. D. Ball.

Subgenus GLADIONURA Osborn

Athysanella-like leaf hoppers with male pygofer narrowed to black hook or process on outer ventral portion and hind tibia with a spur at apex. Genotype—*Athysanella (Gladionura) argenteola* (Uhl.).

KEY TO THE SPECIES OF GLADIONURA

1. With a round, black spot on margin of vertex midway between eye and apex.... 2
Without such a round, black spot 7
2. (1) Outer half of style having form of bent knee with foot attached; posterior margin of last ventral segment of female deeply excavated with long, slender lateral processes *curtipennis*, p. 43
Outer half of style without such form; ♀ segment not deeply excavated... 3
3. (2) Apex of style distinctly bifid, not projecting beyond plates..... *dubia*, p. 41
Apex of style not bifid, projecting beyond plates..... 4
4. (3) Outer third of style roughly sagittate, ventral margin with a hump near end of plate 5
Outer third of style not sagittate, ventral margin almost straight..... 6
5. (4) Styles very long, projecting one-third their length beyond plates; plates truncate at apex, considerably broader than long..... *truncata*, p. 45
Styles with outer point only projecting beyond plates; plates about as long as wide, apex more rounded..... *blanda*, p. 45
6. (4) Style widest on outer third..... *blanda*, p. 45
Style widest before outer third..... *callida*, p. 46
7. (1) Outer portion of style in lateral view resembling a human foot or boot..... 8
Outer portion of style not resembling a foot or boot..... 10
8. (7) Outer third of pygofer narrowed into a very long slender spine, longer than foot of style *uncinata*, p. 47
Outer third of pygofer narrowed into a hook hardly half as long as foot of style 9
9. (8) Style in lateral view much broader through heel of foot than near middle of style *casa*, p. 48
Style in lateral view about same width through heel of foot as at middle of style; toe of foot extended sharply caudad..... *alsa*, p. 48
10. (7) Apex of style in lateral view bifid..... 11
Apex of style in lateral view not bifid..... 16
11. (10) Plates with truncate apices, outer dorsal corner embrowned..... *emarginata*, p. 49
Plates usually rounded, dorsal margin much longer and not embrowned.... 12
12. (11) Arms of apex of style in lateral view more or less equal in length and breadth *furculata*, p. 50
Dorsal arm of apex of style very small, not over half as wide at base as ventral arm 13
13. (12) Dorsal arm of style sharply angular; excavation between arms very shallow and evenly curved *rata*, p. 50
Dorsal arm of style evenly rounded; excavation deep, more or less angular.. 14
11. (13) Spine on hind tibia of male about as long as first tarsal segment.... *libera*, p. 51
Spine on hind tibia of male only about half as long as first tarsal segment.. 15
15. (14) Dorsal point of style quite evenly rounded at base, about three times as wide as ventral point *virida*, p. 52
Dorsal point of style narrower and more angular, about twice as wide as ventral point at base; adult insect about $\frac{1}{2}$ smaller..... *molesta*, p. 52
16. (10) Apex of style in lateral view avicephaliform..... *adunca*, p. 53
Apex of style not avicephaliform..... 17
17. (16) Apex of pygofer hook avicephaliform in lateral view on slide..... 18
Apex of pygofer hook not avicephaliform..... 21
18. (17) Posterior margin of last ventral segment of ♀ with barely a semblance of lobes; style evenly tapered on outer third to tip or excavated only on ventral margin 19
Posterior margin of last ventral segment of ♀ definitely lobed; style on outer third excavated on both margins 20

- 19. (18) Style with both margins evenly curved in on outer third..... *sinuata*, p. 53
 Style on outer third excavated on ventral margin..... *sinuata* var. *lobata*, p. 51
- 20. (18) Last ventral segment of ♀ with all lobes of about equal length; apex of style narrow, curved dorsally..... *lunata*, p. 55
 Last ventral segment of ♀ with middle lobe longest; apex of style truncate, about straight *concaua*, p. 55
- 21. (17) Plates with truncate apices 22
 Plates with rounded or sharp apices..... 27
- 22. (21) Style in lateral view constricted on each margin before tip; apex rounded
 *nacazarana*, p. 56
 Style not constricted on each margin just before tip..... 23
- 23. (22) Apex of style truncate 24
 Apex of style more or less rounded..... 25
- 24. (23) Style clavate on outer third with lobe on dorsal margin before tip.. *clavata*, p. 57
 Style not clavate. Ventral margin deeply excavated on outer third, *directa*, p. 57
- 25. (23) Venter usually black; ventral margin of style straight at apex sharply rounded to dorsal margin *nigriventralis*, p. 58
 Venter not usually black; ventral margin of style undulating..... 26
- 26. (25) Plates as broad at apex as base, margins parallel; style with large lobe on dorsal margin just before apex; ♀ segment very slightly 3 lobed, *dentata*, p. 59
 Plates narrower at apex than base, margins converging; both margins of style undulating; ♀ segment d eply excavated..... *excavata*, p. 59
- 27. (21) Dorsal margin of plates produced into long sharp points..... 28
 Dorsal margin not produced into long sharp points..... 30
- 28. (27) Style curved ventrally in lateral view.....,..... *curvata*, p. 60
 Style curved dorsally 29
- 29. (25) Apex of style truncate..... *contracta*, p. 61
 Apex of style round *sagittata*, p. 62
- 30. (27) Apex of style reaching tip of plates..... 31
 Apex of style exceeding plate by its own width, bent ventrally.... *arcana*, p. 62
- 31. (30) Style spatulate; last ventral segment of ♀ with definite, rather slender lateral lobes *argentola*, p. 63
 Style with apex narrowed; excavated on ventral margin; last ventral segment of ♀ without lateral lobes *diversa*, p. 64

46. *Athysanella (Gladionura) curtipennis* Gill. & Bk.

Athysanus curtipennis Gillette and Baker, Hemip., p. 92, 1898.

Gladionura extensa Osborn, H. Ann. Ent. Soc. Am., p. 711, 1930.

This species is easily recognized by the large, black, footlike styles that are nearly always visible in caudal view, and the very long, slender, lateral lobes on the last ventral segment of the female.

Crown slightly flattened with quite rounded margins; distance between eyes much greater than length of crown at middle. Spur on hind tibia of male usually less than half as long as first tarsal segment.

General color cinereous, with many dark markings, most striking of which are three black spots on margin of crown, a small central and two large laterals; base of crown with two angular dashes and a large spot; pronotum flecked with brown; elytra and abdomen tending to have longitudinal brown lines.

Genitalia. Pygofer of male with attenuated portion almost as long as basal portion, apex with rounded hook; valve slightly longer than preceding segment, rounded; plates wider at base than valve,

rather short, sides almost parallel, apex truncate; styles sinuate, apex in form of a foot with toe in heel out, quite easily visible from exterior and will separate this species from all others; aedeagus in lateral view about as long as styles, almost parallel-sided, slightly curving dorsally, dorsal margin cut away at apex to sharp tip. Last ventral segment of female slightly longer than preceding, lateral margins excavated from base to very long lateral projections, posterior margin broadly and deeply excavated (almost to base) to very slight median prominence.

Holotype female, Colorado Springs, Colo., August 3 (Gill.) allotype male, Colorado, May 13, 1898. In collection Colorado State College, Fort Collins, Colo. Specimens are at hand from Colorado, Arizona, Kansas, Texas, Oklahoma, New Mexico. This is one of the commonest, widespread species in the genus. The type of *extensa* was studied and proved to be a male of *curtipennis*.

47. *Athysanella (Gladionura) dubia* n. sp.

Related to *libera* in genitalia, but much larger, crown more rounded, with round, black dots on margin, styles of male of same type, but hardly half as large, and inner fork about same length as outer. Length: Male, 3.5 mm.; female, 5 mm.

Crown almost excavated, margins broadly rounded; spur on hind tibia of male about as long as first tarsal segment.

General color cinereous with many brown markings. Crown with two black spots on margin, two diverging dashes at apex, and mark on each half of disc, with a comma mark at base; pronotum with eight small, black spots; scutellum usually with two; elytra with brown longitudinal lines; abdomen with longitudinal rows of brown spots; venter more or less darkened.

Genitalia. Pygofer with apices narrowed into long, black, slightly curved points; valve about as long as preceding segment, obtusely angulate; plates wider than valve at base, long, inner margin rounded to outer, not so nearly truncate as in *libera*; styles enlarged on outer half, bifid, prongs of about same length, outer hardly half as wide as inner, the whole scarcely half as large as in *libera*; aedeagus of medium length, in lateral view slightly curved dorsally, sides almost parallel, apex excavated from dorsal margin. Last ventral segment of female about as long as preceding, posterior margin almost straight with a semblance of notches either side a median tooth.

Holotype male, allotype female, 3 male and 1 female paratypes, Baboquivari Mts., Arizona, August 29, 1931, E. D. Ball; other para-

types as follows: 2 males, Nogales, Ariz., September 19, 1931, E. D. Ball; 1 pair, Baboquivari Mts., Arizona, August 19, 1932, R. H. Beamer.

Types and paratypes in collection of E. D. Ball, paratypes in Snow Entomological Collection.

48. *Athysanella (Gladionura) truncata* n. sp.

Size and form of *curtipennis*, but usually very light colored except black spots of margin of vertex; styles not boot-shaped, but sagittal, extending beyond plates and female last ventral segment without long lateral lobes. Length: Male, 3.25 mm.; female, 5 mm.

Vertex slightly convex, margins rounded; spur of hind tibia of male scarcely half as long as first tarsal segment.

General color stramineous, marked with three brown spots on margin of vertex, sometimes with darker markings.

Genitalia. Pygofer of male narrowed to long, black, slightly bent apex; valve longer than preceding segment, obtusely angular; plates broader at base than valve, short, sides almost parallel, apices truncate, sometimes slightly excavated; style, projecting almost one-third its length, enlarged on outer third, both margins converging rapidly to sharp apex; aedeagus of usual form. Last ventral segment of female usually almost hidden beneath preceding segment, posterior margin sinuately rounded, middle portion protruding slightly.

Holotype male, allotype female, and numerous paratypes, Roswell, N. Mex., July 16, 1936, R. H. Beamer and D. R. Lindsay; other paratypes as follows: numerous specimens, Malaga, N. Mex., July 11, 1936, R. H. Beamer. Types in Snow Entomological Collection and paratypes in collection of E. D. Ball.

49. *Athysanella (Gladionura) blanda* n. sp.

Resembling *truncata*, but male plates longer with rounding margins, style but slightly projecting, and not nearly so enlarged. Length: Male, 3 mm.; female, 4.25 mm.

Vertex flat, with margins rounded; spur on hind tibia short, about one-third as long as first tarsal segment.

General ground color stramineous, with darker markings. Vertex with three black spots on margin; elytra with several light brown longitudinal vittae; dorsum of abdomen with brown spots in longitudinal lines.

Genitalia. Pygofer of male narrowed into very long, black, slightly curved apex; valve about as long as preceding segment, angular;

plates broader at base than valve, about as long as valve, inner margin curving to blunt apices; style enlarged on outer two-thirds, sudden swelling on both margins one-third distance to sharp tip; aedeagus typical of the group. Last ventral segment of female almost entirely hidden beneath preceding, showing at middle as an angular process.

Holotype male, allotype female, and numerous paratypes, Belen, N. Mex., July 20, 1936, R. H. Beamer and D. R. Lindsay; other paratypes as follows: numerous specimens, Cochise, Ariz., August 24, 1935, R. H. Beamer; numerous specimens, Wilcox, Ariz., 1934 and 1936, E. D. Ball; 3 pairs, White Sands, N. Mex., July 7, 1933, P. W. Oman.

Types and paratypes in Snow Entomological Collection, paratypes in U. S. N. M. and collection of E. D. Ball.

Gladionura blanda var. *vana* n. var.

Resembling *blanda*, but pygofer of male short and inner margin of style with almost no hump.

Holotype male, allotype female, Bisbee, Ariz., July 16, 1934, E. D. Ball; other paratypes as follows: numerous specimens, Cochise, Ariz., August 24, 1935, R. H. Beamer; 3 males, White Sands, N. Mex., June 7, 1933, P. W. Oman; 2 males and 4 females, Wilcox, Ariz., 1936, E. D. Ball.

Wherever we collected *blanda* specimens with short or cut off pygofers were taken. Coupled with the cut off pygofer was the style with the almost smooth inner side. This is surely just a variation of *blanda*.

50. *Athysanella (Gladionura) callida* n. sp.

Resembling *truncata*, but male plates long, sides converging and style without the great enlargement on outer third.

Vertex slightly convex, margins rounded; spur on hind tibia scarcely more than one-third as long as first tarsal segment.

Color stramineous; vertex with three black spots on margin, laterals much the largest; elytra with faint longitudinal brown lines; dorsum of abdomen with indication of rows of brown spots.

Genitalia. Pygofer of male narrowed to black, almost straight apex; valve longer than preceding segment, obtusely angular, plates wider at base than valve, as long as valve, sides converging to flat apices; style somewhat enlarged on outer half, sides converging on outer third to rather pointed apex; aedeagus of typical form; last

ventral segment of female almost hidden beneath preceding, posterior margin barely showing, very slightly longer at middle.

Holotype male, allotype female, 9 male and 5 female paratypes, Malaga, N. Mex., July 11, 1936, R. H. Beamer; 10 male and 8 female paratypes, Roswell, N. Mex., July 16, 1936, R. H. Beamer and D. R. Lindsay. Types in Snow Entomological Collection, paratypes in collection of E. D. Ball.

51. *Athysanella (Gladionura) uncinata* n. sp.

Resembling *casa*, but outer third of pygofer narrowed into a spine longer than foot of style, and last ventral segment of female with very long median lobe, with practically no laterals. Length: Male, 3 mm.; female, 5.25 mm.

Vertex flat, margins rather sharp; spur short, about one-third length of first tarsal segment.

Color yellowish-green, sometimes with more or less spotting on vertex and dorsum of abdomen.

Genitalia. Pygofer of male narrowed to very long, black, slender apex, turned at right angles; valve about as long as preceding segment, angular; plates wider at base than valve, very long, inner margin curving out to sharp apices; style in lateral view with long projection on outer side near middle, remainder looking much like a decrepit human limb from knee to toe, heel on inner margin in apical view apex with right angled bend toward plate; aedeagus of usual type. Last ventral segment of female about one-third longer than preceding, lateral margins very short, slightly lobed, posterior margin slightly excavated from small lateral lobes to a very large almost quadrate median lobe.

Holotype male, allotype female, 4 female and 6 male paratypes, Bisbee, Ariz., 1934-36, E. D. Ball; other paratypes as follows: numerous specimens, Mustang Mt., Arizona, August 22, 1935, R. H. Beamer; Pearce, Ariz., August 23, 1935, Oxona, Tex., July 9, 1936, Fort Stockton, Tex., July 11, 1936, Lake Kemp, Tex., June 29, 1936, R. H. Beamer; 3 pairs, Chiricahua Mts., Arizona, 1930, E. D. Ball; 4 females, Huachuca Mts., Arizona, 1931, 1 male, 2 females, same place, 1935, E. D. Ball; 1 male, Mustang Mt., Arizona, June 26, 1933, P. W. Oman; other specimens at hand from the following places: Leverton, Tex., Santa Rita Mts., Arizona, Benson, Ariz., Apache, Ariz., Douglas, Ariz., Santa Catalina Mts., Arizona, Tombstone, Ariz., White's City, N. Mex.

Types and paratypes in collection of E. D. Ball, paratypes in U. S. N. M. and Snow Entomological Collection.

52. *Athysanella (Gladionura) casa* n. sp.

Resembling *alsa*, but with foot of style much broader than at its middle; pygofer with larger hook at apex; plates with sharper apices.

Crown but slightly flattened, margins more rounded; spur on hind tibiae of male about two-thirds as long as first tarsal joint.

General ground color yellowish-green, crown and abdomen often marked with darker areas, venter more or less darkened.

Genitalia. Pygofer narrowed to large, black, radically curved apex; valve slightly shorter than preceding segment, angular; plates wider at base than valve, long, inner margin straight, abruptly converging to long, sharp tips; style enlarged on outer two-thirds, an abrupt tooth near middle on outer margin, enlarged to footlike apex, blunt heel on inner margin, toe on outer; aedeagus slender, in lateral view sides almost parallel, slightly bent dorsally apex excavated from dorsal to ventral margin. Last ventral segment of female about as long as preceding, lateral margin rounded to medium process, posterior margin excavated to a much larger and longer median tooth.

Holotype male, allotype female, 7 pairs paratypes, Flagstaff, Ariz., August 6, 1929, E. D. Ball; other paratypes as follows: 2 males, 3 females, Grand Canyon, Ariz., August, 1930, E. D. Ball; 4 pairs, Lake Mary, Ariz., August 6, 1929, E. D. Ball; numerous specimens, Grand Canyon, Ariz., August 11, 1927, R. H. Beamer; numerous specimens, Flagstaff, Ariz., 1927, R. H. Beamer; numerous specimens, Flagstaff, Ariz., 1936, R. H. Beamer and D. R. Lindsay; other specimens at hand from the following places: Springerville, Ariz., Granite Dell, Ariz., Orton, Utah, Silver City, N. Mex., Grand Junction, Colo., Red Lake, Ariz., Las Vegas, N. Mex., Williams, Ariz., Ash Fork, Ariz., St. Johns, Ariz.

53. *Athysanella (Gladionura) alsa* n. sp.

Resembling *casa*, but style in lateral view about one-third narrower, outer point longer and more slender, and last ventral segment of female with almost no lateral processes. Length: Male, 3 mm.; female, 4 mm.

Crown flat, margins rather sharp; spine on posterior tibia of male large, about as long as first tarsal segment.

General ground color yellowish-green, dorsum usually without much darker marking, except for light spotting of abdomen, venter often quite dark.

Genitalia. Pygofer of male as mounted on slide narrowed into

avicephaliform apex; valve shorter than preceding segment, angular; plates broader at base than valve, long, outer margin sinuate, inner margin short, rounding to outer in long, slender tip; style enlarged on outer two-thirds, small rounded hump near middle of outer margin, aside from this outer and inner margin almost parallel, with heel and toe apex; aedeagus in lateral view with sides almost parallel, slightly curved dorsally, apex angular from dorsal to ventral margin. Last ventral segment of female about as long as preceding lateral margin rounded, no processes, posterior margin excavated to large, sharp, median point.

Holotype male, allotype female, 4 male and 5 female paratypes, Colfax county, New Mexico, August 21, 1927, R. H. Beamer; types in Snow Entomological Collection.

54. *Athysanella (Gladionura) emarginata* Osb.

Gladionura emarginata Osborn, H. Ann. Ent. Soc. Am., p. 708, 1930.

Resembling *argenteola*, but male plate truncate at apex and style with bifid tip. Length: Male, 3 mm.; female, 4.5 mm.

Vertex flat, margins rather sharp; spur on hind tibia large, almost as long as first tarsal segment.

Color yellowish-green, vertex sometimes with darker markings; elytra subhyaline, abdomen with semblance of dark longitudinal rows of spots.

Genitalia. Pygofer of male rapidly narrowed to short, black, slightly hooked apex; valve about as long as preceding segment, angular; plates broader at base than valve, slightly longer than wide, sides almost parallel, apex truncate with outer corner longest, covered with black spot; styles enlarged on outer half, varying from almost straight across apex to a bifid tip; aedeagus rather short, in lateral view, with sides almost parallel, slightly curved dorsally, apex sharp, cutaway from dorsal to ventral margin. Last ventral segment of female usually shorter than preceding segment, lateral margins excavated for half their length, posterior margin with tooth at each corner with outer side sloping, inner straight or eut out, middle slightly produced, not usually more than one-third as long as laterals.

Holotype female, Corpus Christi, Tex., H. Osborn. Lectoallotype male, same data, in Osborn Collection.

Specimens are at hand from Texas, Oklahoma, Kansas, Colorado, New Mexico. Some variation has been noted in the depth of excavation in tip of styles.

55. *Athysanella (Gladionura) furculata* n. sp.

Resembling *emarginata*, but plates rounded, apices not embrowned; apex of styles more evenly and deeply excavated and median lobe on last ventral segment of female much longer than lateral. Length: Male, 3.75 mm.; female, 5 mm.

Vertex flat, margins more or less rounded; spur on hind tibia of male large and strongly curved, about as long as first tarsal segment.

Color cinereous marked with brown; vertex with two diverging dashes at apex, a comma-shaped spot inside each ocellus, typical, indefinite boxlike marks on disc, with short dash near base; pronotum with usual transverse row of small spots; elytra with about six light-brown longitudinal stripes, abdomen with brown spots, more or less in longitudinal rows.

Genitalia. Pygofer narrowed into long, black, slightly curved apices; valve about two-thirds as long as preceding segment, obtusely angulate; plates wider at base than valve, very long inner margin curving to long apices; styles large on outer half, bifurcate, in ventral view outer finger more slender and longer than inner; aedeagus rather short, in lateral view sides almost parallel, apex excavated from ventral to dorsal margin, sharp. Last ventral segment of female slightly longer than preceding, lateral margin rounded, posterior margin slightly excavated to strongly produced middle third, which in turn is often excavated into three distinct teeth or broken off so as to appear not produced. After oviposition the middle portion of this segment may be radically changed.

Holotype male, allotype female, 3 female and 4 male paratypes, Granite Dell, Ariz., July 30, 1933, R. H. Beamer; other paratypes as follows: 3 males and 10 females, Santa Rita Mts., Arizona, August 18, 1935, R. H. Beamer; 1 male, 3 females, Atascosa Mt., Arizona, August 15, 1935, E. D. Ball; 1 male and 5 females, Santa Rita Mts., Arizona, August 8, 1935, E. D. Ball. Types and paratypes in Snow Entomological Collection, paratypes in collection of E. D. Ball.

56. *Athysanella (Gladionura) rata* n. sp.

Resembling *emarginata*, but smaller, female last ventral segment with lateral projections much longer, with outer margins almost straight, plates of males without dark spot on outer corner and style with inner margin straight and a sharp projection on outer corner. Length: Male, 2.75 mm.; female, 4 mm.

Vertex flat, margins about medium sharp; spur on hind tibia of male long, slightly longer than first tarsal segment.

Color yellowish-green, usually unmarked except for light-brown spots on abdomen.

Genitalia. Pygofer of male narrowed to fairly long, black shaft bent in even curve at apex; valve about as long as preceding segment, angular; plates wider than valve at base, long, sides almost parallel, apex truncate, outer corner the longest, without black spot; styles enlarged on outer half, inner margin straight, apex arcuate, outer corner narrowed into a handlelike process; aedeagus small, in lateral view with sides almost parallel, curving slightly dorsally, apex sharp, hollowed out from dorsal to ventral margin.

Holotype male, allotype female, Faraway Ranch, Arizona, August 24, 1935, Jean Russell; paratypes as follows: 2 males, n. Colorado, April 22, 1898; 15 pairs, same data as types; numerous specimens, Silver City, N. Mex., 1936, R. H. Beamer and D. R. Lindsay; 1 male, St. Johns, Ariz., August 27, 1934, E. D. Ball. Types in Snow Entomological Collection, paratypes in collection of E. D. Ball.

57. *Athysanella (Gladionura) libera* n. sp.

Resembling *viridia* Osb., but much smaller, not green but with dark flecks, lateral margins of last ventral segment of female without lateral projections and male style with inner fingerlike process angular instead of rounded. Length: Male, 2.75 mm.; female, 4 mm.

Vertex almost flat, margins more or less rounded; spur on hind tibia of male almost as long as first tarsal segment.

Color cinereous with a tinge of green; vertex with more or less darker spots; elytra semihyaline, veins lighter; dorsum of abdomen with usual spots in rows.

Genitalia. Pygofer narrowed into very long slender apices, as in *argenteola*, but slightly curved; valve scarcely as long as preceding segment, obtusely rounded; plates wider at base than valve, long apices almost truncate, outer corner the longest; styles large, bifid, outer branch slender, about two-thirds as long as inner, inner branch about three times as wide as outer, apex angular; aedeagus short, in lateral view converging to sharp apex, ventral margin rounded. Last ventral segment of female about as long as preceding, posterior margin slightly excavate to sharp notch either side a definite median tooth.

Holotype male, allotype female, 10 male and 7 female paratypes, Las Vegas, N. Mex., July 18, 1936, R. H. Beamer; other paratypes as follows: 6 pairs, Silver City, N. Mex., July 22, 1936, D. R. Lindsay; 10 males and 5 females, Silver City, N. Mex., July 22, 1936, R. H. Beamer; 2 pairs, Springerville, Ariz., August 15, 1927, R. H.

Beamer; 1 male, Chiricahua Mts., Arizona, July 4, 1930, E. D. Ball; 2 males, Baboquivari Mts., Arizona, August 29, 1931, E. D. Ball; 4 males and 1 female, Tucson, Ariz., 1936, E. D. Ball. Types and paratypes in Snow Entomological Collection, paratypes in collection of E. D. Ball.

58. *Athysanella (Gladionura) viridia* Osb.

Gladionura viridia Osborn, H., Ann. Ent. Soc. Am., p. 710, 1930.

Resembling *argenteola*, but larger, style of male bifid at apex and pygofer hooks not so long. Length: Male, 3 mm.; female, 4 mm.

Vertex flat, margins sharp; spur on hind tibia of male short, not much more than one-third as long as first tarsal segment.

Color yellowish-green, with abdomen more or less flecked with small spots.

Genitalia. Pygofer of male narrowed into long, slender black, slightly curved apices; valve slightly shorter than preceding segment, angular; plates broader at base than valve, long, inner margins curving to long outer; styles enlarged on outer half, bifid, inner finger much the largest, evenly rounded, outer very short, narrow, rounded; aedeagus short, in lateral view sides almost parallel, dorsal margin cut away to ventral for sharp apex. Last ventral segment of female about as long as preceding, lateral margins excavated to rounded lobes, posterior margin excavated half-way or more to base with a more or less well-defined tooth at middle.

Holotype female and paratypes in Snow Entomological Collection, allotype in Osborn Collection, paratype in U. S. N. M.

59. *Athysanella (Gladionura) molesta* n. sp.

Resembling *viridia* Osb., but much smaller, vertex more sharply angled, apices of plates of males blunter, outer fingerlike process of style longer, inner one excavated on inside margin and, therefore, much narrower and not rounded as in *viridia*. Length: Male, 2.5 mm.; female, 3.75 mm.

Vertex almost concave, margins very sharp; spur on hind tibia of male almost half as long as first tarsal segment.

Color yellowish-green with sometimes some darker markings on vertex and dorsum of abdomen.

Genitalia. Pygofer of male narrowed to long, black apices with curved tip; valve slightly more than half as long as preceding, angular; plates broader at base than valve, long, inner margin broadly rounded at apices to rather blunt tips; styles enlarged on outer half,

bifid, outer process narrower and shorter than inner, inner process excavated on inner margin, longer than wide; aedeagus in lateral view of medium length, almost parallel-sided, very slightly curved dorsally, apex excavated from dorsal to ventral margin. Last ventral segment of female shorter than preceding, lateral margins rounded into short processes, posterior margin excavated half its depth, with a semblance of a notch either side of a median tooth.

Holotype male, allotype female, 1 female and 6 male paratypes, George West, Tex., July 4, 1936, R. H. Beamer; 3 males, Texas, 1, C. V. Riley, 2, R. R. Uhler. Types in Snow Entomological Collection.

60. *Athysanella (Gladionura) adunca* n. sp.

Resembling *sinuata* Osb., but male style with beaklike apex and last ventral segment of female with very long lateral lobes. Length: Male, 3.25 mm.; female, 4.5 mm.

Crown flat, margin rather sharp. Spine on hind tibia of male almost as long as first tarsal segment.

General ground color yellowish-green, usually without much color except a few dark flecks on the abdomen.

Genitalia. Pygofer of male narrowed to black curved tip which under slide resembles outline of an eagle; valve slightly shorter than preceding segment, angular; plates wider at base than valve, short, especially inner margin, apices truncate, outer corner very sharp; styles enlarged on outer half, outer margin deeply excavated just before tip, outline of apex avicephaliform; aedeagus of typical form. Last ventral segment of female slightly longer than preceding, lateral margins rounded into very long processes, posterior margin excavated to base.

Holotype male, allotype female, and numerous paratypes, Baboquivari Mts., Arizona, September 8, 1935, E. D. Ball; numerous paratypes, both sexes, same place, July 19, 1932, R. H. Beamer; 2 pairs, Sabino Canyon, Arizona, June 22, 1933, R. H. Beamer; 1 male paratype, Ajo Mts., Arizona, June 27, 1935, E. D. Ball. Types and paratypes in collection E. D. Ball, paratypes in Snow Entomological Collection.

61. *Athysanella (Gladionura) sinuata* Osb.

Gladionura sinuata Osborn, H., Ann. Ent. Soc. Am., p. 707, 1930.

Gladionura abbreviata Osb., Ann. Ent. Soc. Am., p. 708, 1930.

Resembling *argenteola*, but with style narrowing at apex and last ventral segment of female almost evenly produced. Length: Male, 2.5 mm.; female, 3.5 mm.

General color yellowish-green, occasionally with dusky marks on crown and abdomen.

Spur on hind tibiae of male about as long as first tarsal segment.

Genitalia. Pygofer of male narrowed to black, avicephaliform apex; valve about as long as preceding segment, angular; plates wider at base than valve, long, sides slightly converging, inner margin rounding to long outer point; styles clavate, apex almost sharp; aedeagus as long as enlarged portion of style, in lateral view ventral margin slightly enlarged on middle third. Last ventral segment of female about a third longer than preceding, posterior margin roundly produced, slightly trilobed, median lobe about twice as broad as laterals, often not lobed at all.

Lectoholotype male, and lectoallotype female, Garden of the Gods, Colorado, H. Osborn, in Osborn collection.

Other specimens at hand from Kansas, Oklahoma, Wyoming, Montana, South Dakota, New Mexico.

The types of *Athysanella (Gladionura) abbreviata* Osb. have been studied. The type female (holotype), as Professor Osborn says in the original description, is an abnormal individual. The allotype male is larger than the female, something that rarely, if ever, occurs. Numerous specimens like this male have been taken associated with females in Kansas, Texas, Colorado, and New Mexico, and in none of the hundreds of females examined has one been found that could be said to resemble the holotype female of *abbreviata*. It is the conclusion, therefore, that the male allotype is wrongly associated and that the female holotype is an abnormally developed female of *Athysanella (Gladionura) sinuata* Osb., since specimens of this latter species have been examined that resemble quite closely this abnormal individual.

Athysanella (Gladionura) sinuata var. *lobata* n. subsp.

Resembling *sinuata* Osb., but style of male with angled hump on inner side, with excavated portion from it to apex and female last ventral segment more nearly truncate. Length: Male, 2.5 mm.; female, 4 mm.

Vertex flat to slightly rounded, margins more or less rounded; spur on apex of hind tibia more than half as long as first tarsal segment.

Color yellowish-green, often with semblance of darker longitudinal stripes on elytra and spots on abdomen.

Genitalia. Pygofer of male with apex avicephaliform as in *sinuata*; valve about as long as preceding segment, angular; plates

broader at base than valve, long, inner margin rounding to very sharp apices; style enlarged on outer half, inner margin sharply excavated on outer third to rounded narrow apex; aedeagus in lateral view with sides almost parallel, slightly bent dorsally, apex angled from dorsal to ventral margin, blunt. Last ventral segment of female about as long as preceding, lateral margins rounded, posterior margin slightly excavate to a quite large, angular, median projection.

Holotype male, allotype female, numerous paratypes, Santa Fe, N. Mex., May 29, 1935, P. W. Oman; 2 female and 5 male paratypes, Kenna, N. Mex., August 16, 1936, R. H. Beamer.

Paratypes in collection of E. D. Ball, types and numerous paratypes in U. S. N. M. and Snow Entomological Collection.

62. *Athysanella (Gladionura) lunata* n. sp.

Resembling *sinuata* Osb., but style with inner side of apex deeply excavate and last ventral segment of female definitely three-lobed. Length: Male, 2.75 mm.; female, 4 mm.

Vertex almost flat; margins fairly sharp; spur on hind tibia of male half as long as first tarsal segment.

Color yellowish-green; vertex sometimes with following dark marks: two diverging dashes at apex, a curved dash opposite ocelli; an inverted L on each side of median line and angled dash near base; elytra semihyaline; abdomen often with usual brown spots.

Genitalia. Pygofer narrowed to an avicephaliform apex; valve slightly shorter than preceding segment, angular; plates broader at base than valve, roundly converging to sharp apices; style enlarged on outer half, inner margin deeply emarginate on outer fourth, outer margin slightly excavated on apical fifth, making apex quite slender; aedeagus of usual type. Last ventral segment of female about as long as preceding, posterior margin definitely trilobed, median lobe as wide as laterals combined.

Holotype male, allotype female, 1 male and 2 female paratypes, Luna, N. Mex., July 25, 1936, R. H. Beamer.

63. *Athysanella (Gladionura) concava* n. sp.

Resembling *sinuata* Osb., but male style with deep excavation on inner margin at apex, and female last ventral segment with a definite angular, median lobe. Length: Male, 2.5 mm.; female, 3.75 mm.

Vertex flat, margins medium; spur on hind tarsi of male about two-thirds as long as first tarsal segment.

Color yellowish-green, sometimes with faint brown markings on vertex and abdomen.

Genitalia. Pygofer narrowed into definite avicephaliform apex; valve about as long as preceding segment, angular; plates broader at base than valve, long, inner margin rounding to sharp apices; style enlarged on apical two-thirds, inner margin straight to deeply excavated outer fourth, apex rather truncated; aedeagus small, not so definitely humped as in *G. sinuata*, sides almost parallel, apex angled from dorsal to ventral margin. Last ventral segment of female about as long as preceding, lateral angles rounded, posterior margin slightly excavated to large, median process.

Holotype male, allotype female, and numerous paratypes, Mes-calero, N. Mex., July 15, 1936, R. H. Beamer, and Clouderoft, N. Mex., July 14, 1936. Types and paratypes in Snow Entomological Collection and in collection of E. D. Ball and U. S. N. M.

64. *Athysanella (Gladionura) nacazarana* Osb.

Gladionura nacazarana Osborn, H., Ann. Ent. Soc. Am., p. 711, 1930.

Resembling *argenteola*, but styles much longer than plates, apices of pygofer not nearly so long, and last ventral segment of female with lateral lobes much longer than median. Length: Male, 2.75 mm.; female, 3.75 mm.

Vertex flat, margins quite sharp; spur and hind tibia of male very long, almost as long as first and second segments of tarsi together.

Color yellowish-green, often with usual light-brown markings on vertex and abdomen.

Genitalia. Pygofer narrowed into a medium, long, black point, slightly curved at apex; valve scarcely as long as preceding segment, angular; plates wider than valve at base, long, scarcely narrowed, apices truncate; styles long, projecting beyond plates, slightly narrowed with round, knobbed apices in ventral view; aedeagus short, in lateral view widest near base, dorsal margin cut away from near middle to sharp apex. Last ventral segment of female longer than preceding, lateral margins rounded, posterior margin deeply excavate to a short, rather broad median tooth.

Holotype female, allotype male, Nacazara, Mexico, in Osborn collection. Types studied. Other specimens at hand from the following localities: Santa Rita Mts., Arizona, Baboquivari Mts., Arizona, Patagonia, Arizona, Pearce, Arizona, and Santa Cruz river, Arizona.

65. *Athysanella (Gladionura) clavata* n. sp.

Resembling *argenteola* (Uhl.), but color gray with dark markings; plates with apices truncate or slightly excavated, instead of rounded, styles with outer half heavier, apices nearer truncate, with larger projection on outer margin, and last ventral segment of female protruding instead of excavated. Length: Male, 3.5 mm.; female, 5 mm.

Vertex almost flat, margins quite rounded; spur on hind tibia of male short, less than half as long as first tarsal segment.

Color cinereous, heavily marked with fuscous; vertex with two diverging dashes at apex, more or less united, transverse, curved mark opposite ocellus, inverted L on each side of middle line and spot at base; pronotum more or less infuscated; elytra usually with brown longitudinal stripes, and abdomen with usual brown spots in longitudinal rows.

Genitalia. Pygofer of male narrowed into a long, black, curving apex; valve shorter than preceding segment, angular; plates broader at base than valve, long, margins scarcely narrowing, apices almost truncate, outer, or dorsal, corner much longer; styles clavate in dorsal or ventral view with two rounded projections on outside margin, apical one about twice as large as other; aedeagus in lateral view short, sides almost parallel, apex angled from dorsal to ventral margin. Last ventral segment of female about as long as preceding, lateral margin cut away at edge of preceding segment to small lateral tooth, posterior margin excavated between these.

Holotype male, allotype female, 2 male and 8 female paratypes, Nogales, Ariz., 1933, E. D. Ball; other paratypes as follows: numerous specimens, Baboquivari Mts., Arizona, E. D. Ball, 1935; 18 males and 7 females, Patagonia, Ariz., June 24, 1933, R. H. Beamer; 13 males and 12 females, Patagonia, Ariz., June 24, P. W. Oman; other specimens from the following localities: Blue Springs, N. Mex., Chiricahua Mts., Arizona, Nogales, Ariz., Tucumcari, N. Mex., Concan, Tex. The specimens from this last locality are slightly different, but so close that another species is not justified.

Types in collection of E. D. Ball, paratypes in U. S. N. M. and Snow Entomological Collection.

66. *Athysanella (Gladionura) directa* n. sp.

Resembling *diversa*, but style with inner margin straight to apex, not excavated on outer third, and female last ventral segment with definite lateral processes. Length: Male, 2.5 mm.; female, 4 mm.

Vertex flat, margins medium; spur on hind tibia of male about two-thirds as long as first tarsal segment.

Color yellowish-green, occasionally with semblance of darker marks on vertex.

Genitalia. Pygofer of male narrowed to short, black, curved apices; valve as long as preceding segment, sharply angular; plates wider at base than valve, long, sides almost parallel, apices truncate, dorsal margin slightly longer; style enlarged on outer half, inner margin even, slightly curving in, outer margin narrowed on outer third to truncate apex; aedeagus in lateral view with sides almost parallel, slightly curved dorsally, apex rather blunt, excavated from ventral margin. Last ventral segment of female not much more than half as long as preceding, lateral margin rounded into definite processes, posterior margin excavated to broad median projection, not as long as laterals.

Holotype male, allotype female, 19 pairs paratypes, Rocksprings, Tex., July 9, 1936, R. H. Beamer and M. B. Jackson; other paratypes as follows: 2 males and 1 female, San Antonio, Tex., July 4, 1936; one pair, Sabinal, Tex., July 6, 1936, D. R. Lindsay; 7 males and 5 females, Concan, Tex., 1 male, Castroville, Tex., D. R. Lindsay; 5 pairs, Leakey, Tex., July 8, 1936, R. H. Beamer.

Types and paratypes in Snow Entomological Collection, paratypes in collection of E. D. Ball and U. S. N. M.

67. *Athysanella (Gladionura) nigriventralis* n. sp.

Resembling *contracta*, but venter quite dark, inner margin of style not excavated and lateral processes of last ventral segment of female much longer than median. Length: Male, 3 mm.; female, 4 mm.

Vertex flat, margins medium; spur on hind tibia of male long and curved, longer than first tarsal segment.

Color yellowish-green, usually with the following dark marks; vertex with two diverging dashes at apex, a curved dash extending in from ocellus, boxlike mark on each side of disc and an angled dash on each half next base; each segment of dorsum usually with a transverse row of very fine brown spots; venter usually almost entirely black.

Genitalia. Pygofer of male narrowed into a black, generally curving apex; valve about as long as preceding segment, angular; plates broader than valve at base, sides almost parallel, apex almost truncate, dorsal corner longest; style enlarged on outer half, outer margin excavated on outer third, inner margin almost straight; aedeagus in lateral view with sides almost parallel, very slightly curved dorsally, apex angulate from dorsal to ventral. Last ven-

tral segment of female about as long as preceding, lateral margins produced into long rounded lobes, posterior margin excavated almost to base, with slight bulging at middle.

Holotype male, allotype female, 11 male and 9 female paratypes, Silver City, N. Mex., July 22, 1936, R. H. Beamer and D. R. Lindsay; 8 male and 8 female paratypes, Frijole, Tex., July 16, 1933; 1 male, Carlsbad Cavern, N. Mex., 1934, E. D. Ball.

Types in Snow Entomological Collection, paratypes in collection of E. D. Ball.

68. *Athysanella (Gladionura) dentata* n. sp.

Resembling *clavata*, but last ventral segment of female with posterior margin smooth on lateral third, style with lateral process near tip almost as broad as width of shaft, and aedeagus covered with numerous minute pegs on outer two-thirds. Length: Male, 4 mm.; female, 5.5 mm.

Vertex flat, margin medium; spur on hind tibia of male as long as first tarsal segment, curved.

Color cinereous, often with a yellowish-green tinge, often with semblance of brown markings throughout.

Genitalia. Pygofer narrowed into a large, black, evenly curved apex; valve about as long as preceding segment, angular; plates wider at base than valve, sides almost parallel, apex truncate, dorsal margin longest; style enlarged on outer two-thirds, outer margin with large bump just before apex; aedeagus in lateral view of moderate length, sides almost parallel, apex angled from dorsal to ventral margin, ending in small hook, outer two-thirds with numerous small peglike structures. Last ventral segment of female scarcely as long as preceding, posterior margin rounded from base to small definite notch either side a short, blunt median tooth.

Holotype male, allotype female, 4 male and 5 female paratypes, Durango, Colo., July 2, 1933, P. W. Oman; numerous paratypes, same locality, R. H. Beamer, July 4, 1937.

Types in U. S. N. M., paratypes in Snow Entomological Collection and collection of E. D. Ball.

69. *Athysanella (Gladionura) excavata* (Osborne)

Athysanella excavata Osborne, H., Ann. Ent. Soc. Am., XXIII, p. 704, 1930.

Resembling *argenteola* (Uhler), but distinctly larger, and female last ventral segment deeply excavated. Length, 3-5 mm.

General color grayish or yellowish-green in dry specimens, living specimens iridescent green. Slight dark markings often present on crown and abdomen.

Crown rather flat and sharp; spur on hind tibia of male less than half as long as first segment of tarsi.

Genitalia. Posterior margin of last ventral segment of female with lateral angles sharp, deeply excavated on middle two-thirds, with small median tooth usually barely showing past penultimate segment.

Male pygofer narrowed to long, black, curving apex; valve about same length as the preceding segment, angular; plates wider than valve at base, long, sides but slightly narrowed to blunt apices, longest on dorsal margin; style enlarged on outer half, inner margin slightly excavated near middle, rounding toward outer on outer fourth, outer margin with slight excavation either side of a median projection, giving a slight trilobed appearance; aedeagus of normal type.

The allotype male described above and numerous paratypes, Boca Chica, Tex., June 30, 1938, R. H. Beamer, are here designated. One paratype, same place 1933, P. W. Oman.

The holotype female, San Antonio, Tex., has been studied in addition to numerous specimens, both male and female, collected this past summer (1938) at Boca Chica, Tex.

The species was named from females only, hence was placed in the wrong subgenus.

70. *Athysanella (Gladionura) curvata* n. sp.

Resembling *contracta* n. sp., but apices of male plates longer and more slender, on a slide the styles curve in instead of out, pygofer hooks much longer and heavier, extending out and up and the last ventral segment of the female, although shaped much the same has larger lateral projections and a truncated median projection that is much shorter than the laterals. Length: Male, 3 mm.; female, 4 mm.

Vertex slightly excavated, margins sharp; spur on hind tibia of male about two-thirds as long as first tarsal segment.

Color yellowish-green, usually without dark markings.

Genitalia. Pygofer of male narrowed to very long, heavy straight projections, extending out and dorsally; valve scarcely as long as preceding segment, obtusely angled; plates wider than valve at base, sides almost parallel, scarcely touching on mesal margin, apices narrowed to very long outer points; style thickened on outer two-thirds, on the slide, curving in with outer margin smooth, an angular projection near middle of inner margin and apex strongly contracted; aedeagus typical of most species in this genus, slightly tapered to-

ward apex in lateral view. Last ventral segment of female about as long as preceding, lateral angles excavated to rather broad processes, posterior margin excavated from these processes to a broad truncate median projection about half as long as laterals.

Holotype male, allotype female, and numerous paratypes, Little Beaver Creek, Colorado, July 11, 1937, R. H. Beamer and C. L. Johnston, at a point not far from Pingree Park, Colorado. Types and paratypes in Snow Entomological Collection.

71. *Athysanella (Gladionura) contracta* n. sp.

Resembling *argenteola* (Uhler), but style of male contracted to half greatest width and posterior margin of last ventral segment of female with inward, projecting lateral lobes, and large median lobe as long as laterals. Length: Male, 3 mm.; female, 4 mm.

Vertex flat, margins medium; spur on hind tibia of male long, curved, reaching about to apex of first tarsal segment.

Color yellowish-green, sometimes with a semblance of darker marks on vertex and abdomen.

Genitalia. Pygofer of male narrowed to rather short, black, slightly curved apex; valve little more than half as long as preceding segment, obtusely angled; plates wider at base than valve, very long especially on outer margin, inner margin roundly narrowed to long, slender apices; styles enlarged on outer two-thirds, widest near middle, contracted on outer fourth to half greatest width; aedeagus short, without specific value. Last ventral segment of female about as long as preceding, lateral margins roundly excavated, posterior margin deeply excavated either side a large median lobe, lateral lobes projecting inward.

Holotype male, allotype female, 2 male and 9 female paratypes, Osborne, Kan., September 9, 1936, R. H. Beamer; other paratypes as follows: 6 males and 4 females, Scott county, Kansas, State Park, August 21, 1936, R. H. Beamer; 4 pairs, Slade, Kan., September 9, 1936, M. E. Griffith; 1 pair, Dickinson county, Kansas, R. H. Painter; 2 males, Ellsworth county, Kansas, D. A. Wilbur; 7 males and 14 females, Seymour, Tex., June 30, 1936, R. H. Beamer; 6 males, 4 females, Yarnell Hts., Arizona, 1929, E. D. Ball; 3 males, 2 females, Santa Rita Mts., Arizona, 1931, E. D. Ball; 1 male, 7 females, Patagonia, Ariz., E. D. Ball; 3 males, 1 female, Huachuca Mts., Arizona, July 14, 1934, E. D. Ball. Other specimens at hand from Loveland, Colo., Waynoka, Okla., Fox Ridge, S. Dak., Cappa, S. Dak., Ashfork, Ariz., Silver City, N. Mex., Frijole, Tex.

72. *Athysanella (Gladionura) sagittata* n. sp.

Resembling *contracta*, but larger, male styles more enlarged, with apex rounded instead of truncated, and median process of last ventral segment of female at least three times as broad as laterals. Length: Male, 4 mm.; female, 5 mm.

Vertex flat, margins medium; spur on hind tibia of male as long as first tarsal segment, curved.

Color cinereous, with a yellowish-green tinge, usually with a semblance of brown spots on vertex and usual rows on abdomen.

Genitalia. Pygofer of male narrowed to rather short, black, curved, apex; valve slightly shorter than preceding segment, angular; plates broader at base than valve, very long, inner margin broadly rounded to long, slender apices; styles enlarged on outer half, apices narrowed, rounded, somewhat sagittate in shape; aedeagus in lateral view with sides almost parallel, slightly curved dorsally, apex excavated from dorsal to ventral margin, with hook at tip. Last ventral segment of female about as long as preceding, lateral angles with rather long processes, posterior margin excavated almost to base, with very broad median projection, often with a semblance of a notch either side of middle.

Holotype male, allotype female, 13 male and 7 female paratypes, Hurley, N. Mex., August 25, 1935, R. H. Beamer; other paratypes as follows: 1 male, Douglas, Ariz., June 10, 1936, E. D. Ball; 11 males, 22 females, Pearce, Ariz., August 23, 1935, R. H. Beamer; 12 males, 12 females, Mustang Mt., Arizona, August 22, 1935, R. H. Beamer; numerous specimens Elkins, N. Mex., 1936, R. H. Beamer and D. R. Lindsay.

Types in Snow Entomological Collection, paratypes in collection of E. D. Ball and U. S. N. M.

73. *Athysanella (Gladionura) arcana* n. sp.

Resembling *argenteola*, but styles projecting beyond plates and pygofer hooks much shorter. Length: Male, 3 mm.; female, 4 mm.

Vertex flat, margins angular; spur on hind tibia of male as long as first tarsal segment.

Color variable from buff to yellowish-green, often with darker marks on vertex and abdomen; elytra often with veins lighter.

Genitalia. Pygofer of male narrowed to short, black, very slightly curved apex; style about as long as preceding segment, angular; plates wider at base than valve, long, slightly narrowed to bluntly rounded apices; style protruding, enlarged on outer two-thirds,

rounded hump near middle of outside margin, apex in form of dogs' head, nose in; aedeagus in lateral view short, sides almost parallel, slightly curved dorsally, apex excavated from dorsal to ventral margin. Last ventral segment of female almost hidden beneath the preceding, posterior margin barely showing on lateral margins, slightly wider near middle.

Holotype male, allotype female, and numerous paratypes, 47 miles west, Sheffield, Tex., July 10, 1936; other paratypes as follows: numerous specimens, Marfa, Tex., August 7, 1936, E. D. Ball; 2 males and 1 female, Otero county, New Mexico, June 17, 1929, R. H. Painter; 1 male, Chiricahua Mts., Arizona, June 9, 1933, P. W. Oman; other specimens are at hand from the following localities: Wilcox, Ariz., Rodeo, Ariz., Ozona, Tex., White's City, N. Mex., Fort Stockton, Tex., Hurley, N. Mex.

Types in Snow Entomological Collection, paratypes in U. S. N. M. and collection of E. D. Ball.

74. *Athysanella (Gladionura) argenteola* (Uhler)

Deltocephalus argenteolus Uhler, P. R., Bul. U. S. Geol. Survey, iii, p. 473, 1877.

This is one of the commonest leaf hoppers in the short grasses of the western plains. It is characterized by its golden green color, which becomes yellowish-green after death; plates long with rounded apices, styles clavate, about as long as plates; pygofer narrowed into very long, slender, black spines, hooked at tips.

Vertex flat, margins medium; spur on hind tibia of male as long as first tarsal segment.

Color yellowish-green, often marked with fuscous on vertex and abdomen.

Genitalia. Pygofer of male with apical portion about one-third as long as whole, very slightly curved; valve about as long as preceding segment, angular, plates at base wider than valve, long, narrowing slightly to just before apex, when inner margin curves rapidly to meet outer; styles about as long as plates, apices rounded, flat, notch on outer margin one-third distance from tip; aedeagus rather short, curving slightly, apex sharp. Last ventral segment of female about as long as preceding, lateral angles excavated on outer half, posterior margin broadly excavated from rounded lateral corners to broadly rounded median portion just shorter than lateral lobes.

Lectoholotype, macropterous female, labeled in Uhler's handwriting as follows: "Colo. Sp. 13/8." and allotype male, Peyton, Colo., August 19, 1936, R. H. Beamer, are here designated. Holo-

type in U. S. N. M., allotype in Snow Entomological Collection. Specimens at hand from Kansas, Texas, New Mexico, Arizona, Colorado, Wyoming, South Dakota, Oklahoma, Nebraska.

75. *Athysanella (Gladionura) diversa* n. sp.

Resembling *contracta*, but style with inner margin concave on outer third and outer margin convex, and female last ventral segment with posterior margin without lateral processes, and very large median projection. Length: Male, 3.5 mm.; female, 5 mm.

Vertex flat, margins sharp; spur on hind tibia of male about as long as first tarsal segment. Color yellowish-green, often marked with fuscous on vertex and abdomen.

Genitalia. Pygofer of male narrowed into a short, black apex with slight hook; valve about as long as preceding segment, angular; plates broader at base than valve, very long, sides almost parallel, inner margin rounded to rather blunt apices; styles enlarged on outer two-thirds, inner margin concave on outer third, outer margin convex just opposite; aedeagus rather short, in lateral view sides almost parallel, apex sharp, excavated from dorsal to ventral margin. Last ventral segment of female about as long as preceding, at lateral margins scarcely extending beyond preceding segment, posterior margin strongly produced at middle.

Holotype male, allotype female, and numerous paratypes, Yarnell, Ariz., July 29, 1933, R. H. Beamer, 6 pairs paratypes, Yarnell Hts., Arizona, October 4, 1929, E. D. Ball. Types and paratypes in Snow Entomological Collection, paratypes in collection of E. D. Ball.

Brachydella, new subgenus

Like *Gladionura* but with vertex very flat, almost concave, with margin rounded from eye to eye, meeting front in very thin, almost foliaceous margin. Pygofer narrowed into long hook, and male with long spur on hind tibia. The type of subgenus is *Athysanella (Brachydella) abdominalis* n. sp.

76. *Athysanella (Brachydella) abdominalis* n. sp.

Resembling the species of *Gladionura*, but larger and more slender with the very flat vertex and extremely sharp margins. Length: Male, 4.5 mm.; female, 6.5 mm.

Vertex wider than long, flat to concave, margin rounded from eye to eye, very sharp, almost foliaceous; head wider than pronotum; elytra short, exposing seven abdominal segments, apices slightly

rounded, venation indefinite; abdomen long, narrow, female with sharp extended ovipositor; males with large spur on hind tibia, about two-thirds as long as first tarsal segment.

Color cinereous with fuscous markings; vertex with three black spots on margin, a cross row of four longitudinal dashes near middle and a semblance of two pairs of dashes at base; pronotum with six longitudinal stripes, middle pair ending on scutellum; elytra with a semblance, at least, of dark longitudinal stripes with light veins; abdomen usually with six longitudinal stripes, the laterals often broken into a spot on each segment; venter varies from black to dark spotted.

Genitalia. Last ventral segment of female of about same length as preceding; posterior margin with slight lateral lobes, slightly excavated most of its breadth, with three short lobes at middle, the central one much broader than laterals. Valve of male shorter than preceding segment, angular; plates broader at base than valve almost three times as long, outer margins converging to sharp apices. Pygofer of male narrowed on outer third to long black hook; style short not reaching middle of plates, outer third curved dorsally on ventral margin, with a large notch on dorsal margin; aedeagus in lateral view widest on basal half, slightly curved dorsally on apical third.

Holotype male, allotype female, Santa Rita Mountains, Arizona, August 18, 1935, E. D. Ball. Paratypes as follows: one pair, same data as types; 1 male, Atascos Mountain, Arizona, August 16, 1935, E. D. Ball; 20 males and 17 females, Santa Rita Mountains, Arizona, August 18, 1935, R. H. Beamer.

Types and paratypes in collection of E. D. Ball. Paratypes in U. S. N. M. and Snow Entomological Collection.

Pedumella, new subgenus

Like *Athysanella*, but male with no spur on apex of hind tibia and pygofer narrowed to a black hook. Type of the subgenus *Athysanella* (*Pedumella*) *spatulata* n. sp.

KEY TO SPECIES OF SUBGENUS *PEDUMELLA*

- | | | |
|---|-----------------------|----|
| Outer third of style of male enlarged, flattened, pygofer narrowed into a long, black, sickle-shaped process; posterior margin of last ventral segment of female with definite lateral lobes | <i>spatulata</i> , p. | 66 |
| Outer third of style with right-angled notch in dorsal margin; pygofer narrowed into a short process bent at right angles; posterior margin of last ventral segment of female without lateral lobes | <i>recurvata</i> , p. | 66 |

77. *Athysanella (Pedumella) spatulata* n. sp.

Resembling *recurvata*, but outer third of male style spatulate without the narrowed ventral apical process. Length: Male, 3 mm.; female, 4.5 mm.

Vertex concave, margins sharp; styles visible externally.

Color cinereous; some specimens with a semblance of usual dark markings on vertex, pronotum, and elytra; dorsum of abdomen with cross rows of spots and a semblance of the longitudinal stripes.

Genitalia. Pygofer of male narrowed into large, black, evenly curved, sickle-shaped apex; valve longer than last ventral segment, broadly angular; plates broader at base than valve, long, slightly converging to blunt apices; style spatulate on outer third, apex truncate; aedeagus in lateral view, long, slender, slightly curved dorsally, excavated ventral to dorsal to sharp apex. Last ventral segment of female longer than preceding, lateral margins rounded to definite lateral lobe, posterior margin sharply excavated to a short, rounded median lobe.

Holotype male, allotype female, and 9 male paratypes, St. John, Ariz., July 26, 1936, R. H. Beamer; paratypes as follows: one male, Hurley, N. Mex., August 25, 1935, R. H. Beamer; 7 males, Marathon, Tex., July 9, 1938, R. H. Beamer. Types in Snow Entomological Collection.

78. *Athysanella (Pedumella) recurvata* (Osborn)

Gladionura recurvata Osborn. Ann. Ent. Soc. Am., Vol. 23, 1930, p. 706.

Resembling *lunata*, but without a spur on hind tibia and female last ventral segment without lateral lobes on posterior margin. Length: Male, 3.5 mm.; female, 5 mm.

Vertex flat, margins angular; styles visible externally; no spur on hind tibia of male.

Color yellowish-green, very faintly marked, if at all; an occasional specimen with diverging dashes at apex of vertex and semblance of other marks; pronotum with semblance of cross row of dots; dorsum of abdomen with four cross rows of dots and an occasional specimen with longitudinal stripes.

Genitalia. Pygofer of male narrowed to a thick, black point bent at right angles; valve about as long as preceding segment, obtusely angular; plates wider at base than valve, long, inner margin rounding to long slender tips; style enlarged on outer two-thirds, apex greatly narrowed for space about equal to width at middle; aedeagus in lateral view widest on basal two-thirds, apex angled from

dorsal to ventral margin, ventral margin slightly serrate. Last ventral segment of female hidden beneath preceding at margin, produced into an angular tooth at middle.

Since the type of this species is lost, a female neoholotype and male allotype, Ashfork, Ariz., August 16, 1929, E. D. Ball, described above, are here designated. In collection of E. D. Ball.

Specimens are at hand from the following localities: Painted Desert, Ariz., Lupton, Ariz.; Williams, Ariz.; Kanab, Utah; Chads, Utah; Provo, Utah; Westwater, Colo.; Grand Junction, Colo.; Elsinore, Utah; White's City, N. Mex.; St. Johns, Ariz.

Gillettella Osb.

This genus is characterized by the conical head, rather short elytra, long ovipositor, and male genitalia of the type more often found in other genera of leaf hoppers than in *Athysanella*. The type of the genus is *Gillettella labiata* (Gill.).

KEY TO SPECIES OF *GILLETTIELLA*

- | | |
|--|-----------------------------|
| 1. Apex of vertex with round black spot..... | 2 |
| Apex of vertex without round black spot..... | <i>labiata</i> , p. 67 |
| 2. Vertex very sharp, sides almost straight, markings broad..... | <i>atropunctata</i> , p. 68 |
| Vertex much blunter, margins rounded, markings narrow..... | <i>fasciata</i> , p. 69 |

79. *Gillettella labiata* (Gill.)

Deltocephalus labiata Gillette, Colo. Exp. Sta. Bull. 43, p. 26, 1898.

Deltocephalus labiata var. *rufus* Gillette, Colo. Exp. Sta. Bull. 43, p. 26, 1898.

Easily separated from other members of this genus by the lack of intense black spot on apex of vertex. Length: Male, 2.5 mm.; female, 4 mm.

Vertex rounded, margins rounded to front; elytra short, exposing about five abdominal segments, hind margin truncate most often, but may vary to pink.

Color cinereous, female with a semblance of dark spots on abdomen and vertex; male with three pairs of spots, angular at apex, rectangular on disc and rounded at base; pronotum with transverse row of dark spots anteriorly; elytra dark with veins lighter and light cross band at tips with apical cells darker; abdomen dark brown except next to last segment, which is light with transverse row of brown spots and a median, longitudinal, light stripe.

Genitalia. Pygofer of male slightly narrowed to rounded apex; valve longer than preceding segment, angular, apical third more acute; plates wider at base than valve, narrow, slightly longer than valve, inner margin almost straight, outer rounded to sharp apices;

style broad on basal half, outer third very narrow, sides almost parallel, curved out; aedeagus in lateral view long and slender, bent dorsally at about a right angle near basal fourth, sides almost parallel, slightly converging. Last ventral segment of female broader than preceding, lateral margin rounded to small lateral process, posterior margin excavated to a broad median eminence as long as laterals.

Types in collection of Colorado Agricultural College. Specimens at hand from Kansas, Oklahoma, Texas, New Mexico, Arizona, Colorado, Nebraska, South Dakota, Wyoming.

This is a very common, widespread species, often varying in color with the type of soil. So variable is the general color that to use the varietal name *rufus* would be confusing.

80. *Gillettella atropunctata* (Gill.)

Deltoccephalus atropunctata Gillette, C. P., Colo. Exp. Sta. Bull. 43, p. 28, 1898.

Resembling *labiata*, but smaller and with very black spot on apex of vertex. Length: Male, 2 mm.; female, 4 mm.

Vertex sharp, disc rounded, margins rounded to front, about twice as long as distance between eyes.

Color cinereous, with dark markings as in *labiata*, but more extended and darker with the small, very black spot on apex of vertex.

Long-winged female is much larger than the short-winged female; elytra with two cross-nervures and more rounded apices and veins light with cells embrowned.

Genitalia. Pygofer of male with sides almost parallel, apex broadly rounded; valve as long as preceding segment, apex sharply angled; plates broader at base than valve, inner margins contiguous, outer margin rounded to medium sharp apices; style greatly narrowed on outer third, bent out at 45 degrees; aedeagus in lateral view bent dorsally in semicircle, long and slender. Last ventral segment of female longer than preceding, posterior margins rounded to small lateral processes, posterior margin slightly excavated from lateral processes to very broad, rounded middle portion of about same length as lateral portions.

Lectoholotype female, Fort Collins, Colo., September 27, C. P. Gillette; allotype male, Fort Collins, Colo., May 29, 1898. This species is at hand from the following states: Colorado, Arizona, New Mexico, Texas, Oklahoma, Kansas. Our collecting would indicate a heavier population of this species in Texas.

81. *Gillettella fasciata* n. sp.

Resembling *atropunctata*, but much larger, vertex blunter with two dark cross bands and two longitudinal stripes on thorax. Length: Male, 2.5 mm.; female, 4.25 mm.

Vertex highly arched, margins rounded, slightly longer at middle than width between eyes; elytra exposing about three abdominal segments, apices rounded.

Color cinereous; vertex with a round black apical spot, two darker cross bands indicated on disc, with an indication of two converging stripes on basal half, continuing across pronotum to end on scutellum; dark stripe on pronotum back of each eye; elytra darker with veins lighter; dorsum of abdomen with indication of three pairs of brown longitudinal stripes.

Genitalia. Pygofer of male narrowed to bluntly rounded apices; valve of male angular with outer third sharply angled, plates wider at base than valve, about as long as valve, margins rounded to almost an oval shape; style with outer third very narrow, bent out and serrated on outer margin; aedeagus in lateral view long and narrow, bent dorsally at about a right angle, gradually narrowed to sharp apex. Last ventral segment of female about as long as preceding, lateral margins rounded to a shallowly excavate posterior margin.

Holotype male, allotype female, and one female paratype, Santa Fe, N. Mex., June 29, 1935, P. W. Oman; one paratype female, 5.7 miles west of Grady, N. Mex., June 28, 1929, *Salsola pestifer*. Types in U. S. N. M.

THE GENUS *DORATURA* Boh.

Usually short-winged, vertex round from eye to eye, margin sharp, disc excavated, male genitalia small compared to *Athysanella*, extending but slightly beyond last abdominal segment, more like that of *Lonatura* in this respect. The genotype is *D. stylata* Boh.

Only one species of this genus has been found in this country and it is identical with *Doratura stylata* Boh. of Europe, except smaller.

82. *Doratura stylata* (Boh.)

Athysanus stylatus Boheman, C. H. K., Vet. Ac. Handl., 1847.

Resembling *Brachydella abdominalis* in the shape and sharpness of vertex, but much smaller, lacks the spur on hind tibia and plates are almost truncate. Length: Male, 3.5 mm.; female, 4 mm.

Vertex wider between eyes than median length, usually quite

rounded from eye to eye, margin sharp, disc excavated at least just back of margin, elytra of short-wing forms exposing six abdominal segments, truncate, venation obscure in long-winged females, extending almost to tip of ovipositor; hind wings mere pads in former and normal length in latter. In dorsal view body widest in region of second abdominal segment. Female ovipositor about as in *Athy-sanella*. Male genitalia smaller, superficially resembling *Lonatura*.

Color tawny, marked with black; face with two black cross stripes; vertex margin with three black spots, median larger, more or less rectangular, disc with semblance of boxlike spot; pronotum with semblance of crossrow of darker spots; dorsum of abdomen with semblance of six longitudinal stripes, often with a narrow, lighter median stripe; venter with two black cross bands on face; females with segments of abdomen more or less infuscated, those of males with large black lunate cross spot occupying a large portion of each sclerite.

Genitalia. Pygofer of male short, rectangular; valve short, obtuse, barely visible externally; plates broad at base, sinuately narrowed on outer margin to broadly rounded apices; aedeagus in lateral view broad on basal half, bent dorsally just before middle and much narrowed to apex; styles with peculiar flaplike process near attachment to plates, slightly broadened for about one-fourth distance to tip, then sharply bent dorsally and narrowed to long, slender, curving apices.

Numerous specimens are at hand from Wisconsin, Michigan and Massachusetts. Long-winged females are fairly common.

There is apparently no difference in the specimens in this country and those in Europe except these are smaller in size. The internal genitalia of the male are alike too, except smaller.

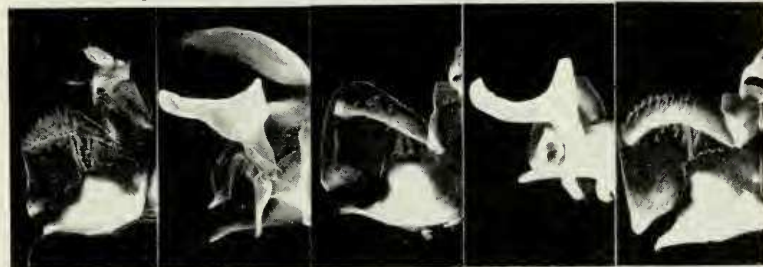
PLATE I



1. *At. gardenia*

2. *At. magdalena*

3. *At. fredonia*



3. *At. fredonia*

4. *At. plana*

5. *At. incongrua*



6. *At. terebrans*

7. *At. incerta*

8. *At. parca*



8. *At. parca*

9. *At. laeta*

10. *At. tenera*

PLATE II

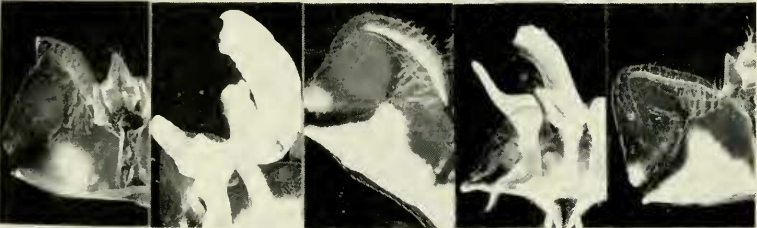
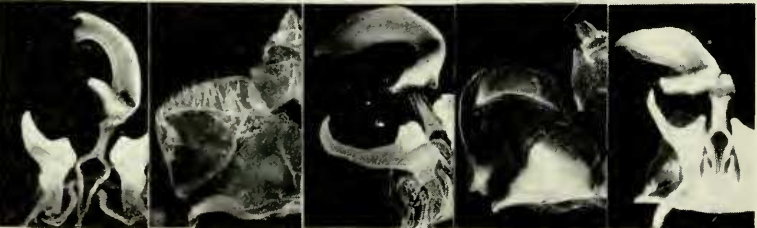
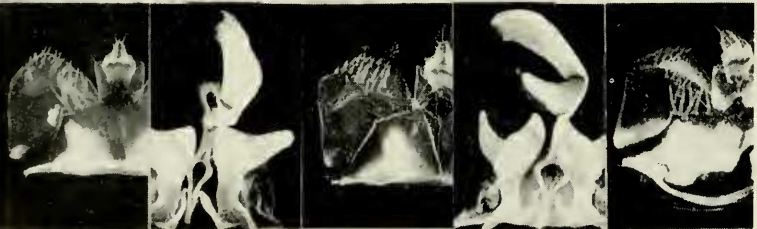
11 *At. aspersa*12. *At. robusta*13. *At. globosa*13. *At. globosa*14 *At. foeda*15. *At. kanabana*16. *At. salsa*17. *At. rostrata*18. *At. utahna*18. *At. utahna*19. *At. supina*20. *At. bifida*

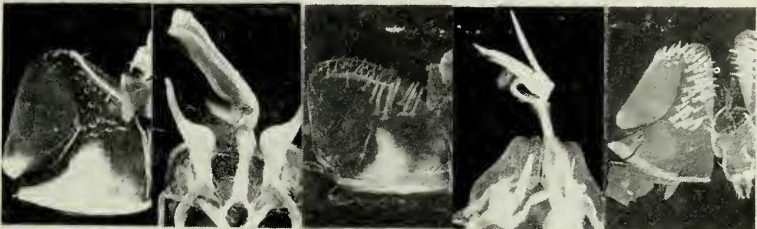
PLATE III



21. *At. planata*

22. *At. yumana*

23. *Am. ardua*



23. *Am. ardua*

24. *Am. playana*

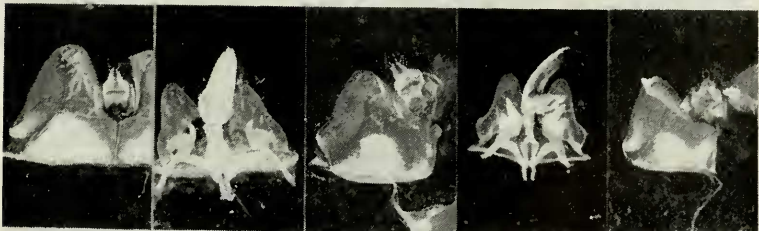
25. *Am. rubicunda*



26. *Am. skullana*

27. *Am. nigrofascia*

28. *Am. triodana*

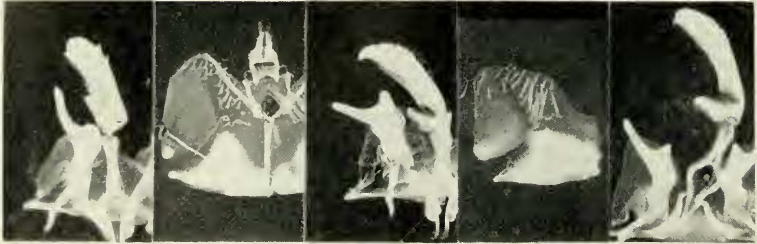


28. *Am. triodana*

29. *Am. nimbata*

30. *Am. texana*

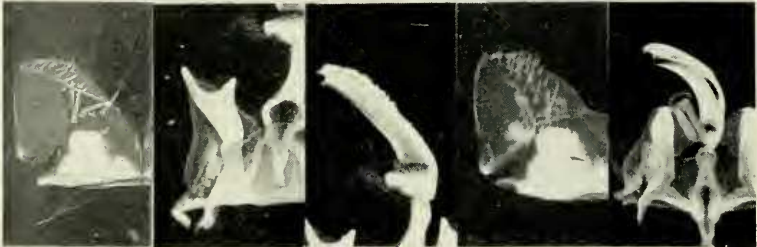
PLATE IV



31. *Am. anzana*

32. *Am. balli*

33. *Am. stylata*



33. *Am. stylata*

34. *Am. reticulata*

35. *Am. aridella*



35. *Am. aridella*

36. *Am. obesa*

37. *Am. minor*



38. *Am. turgida*

39. *Am. hamata*

40. *Am. attenuata*

PLATE V



40. *Am. attenuata*

41. *Am. wilburi*

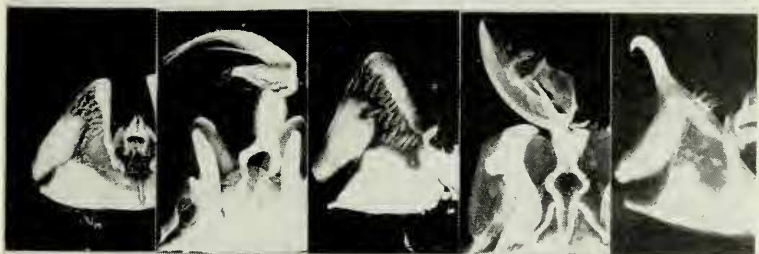
42. *Am. occidentalis*



42. *Am. occidentalis*

43. *Am. acuticauda*

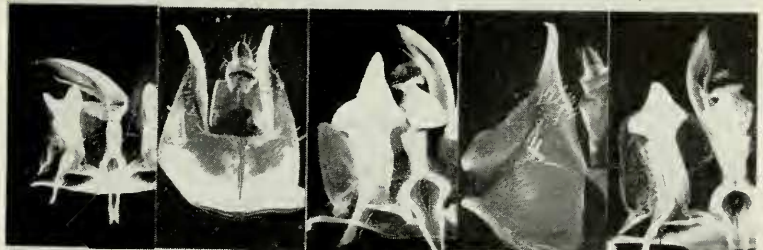
44. *Am. modesta*



44. *Am. modesta*

45. *Am. kansana*

46. *Gl. curtippennis*



47. *Gl. dubia*

48. *Gl. truncata*

49. *Gl. blanda*

PLATE VI

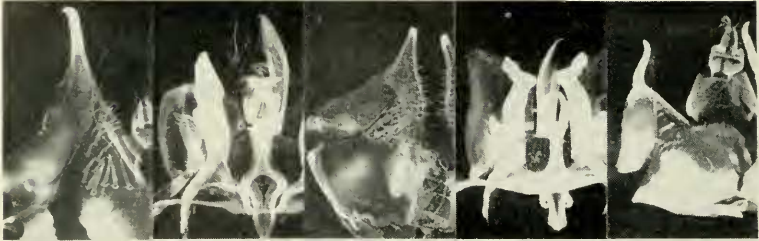
49 *Gl. blanda*50 *Gl. callida*51 *Gl. uncinata*52. *Gl. casa*53. *Gl. alsa*54 *Gl. emarginata*54. *Gl. emarginata*55. *Gl. furculata*56. *Gl. rata*57. *Gl. libera*58. *Gl. viridia*59. *Gl. molesta*

PLATE VII



59 *Gl. molesta*

60 *Gl. adunca*

61 *Gl. sinuata*



62 *Gl. lunata*

63 *Gl. concava*

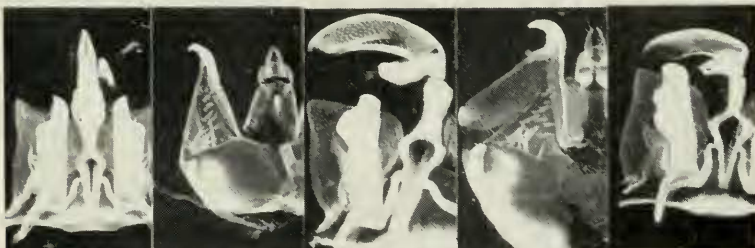
64 *Gl. naczarona*



64 *Gl. naczarona*

65 *Gl. clavata*

66 *Gl. directa*



67 *Gl. nigriventralis*

68 *Gl. dentata*

69 *Gl. excavata*

PLATE VIII

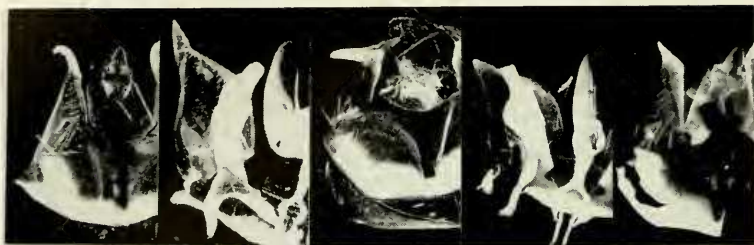
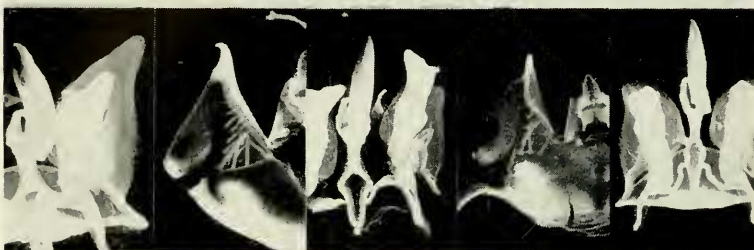
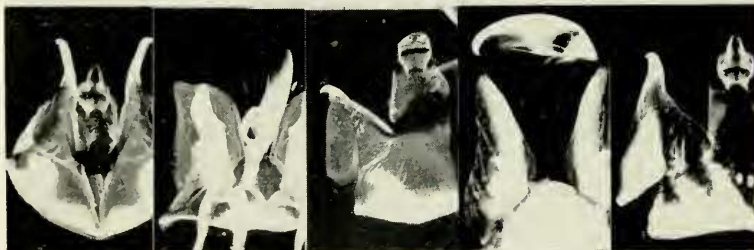
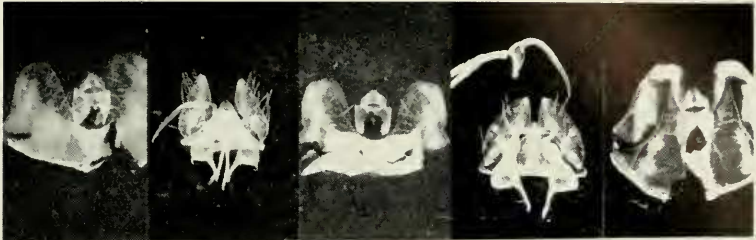
69 *Gl. excavata*70. *Gl. curvata*71. *Gl. contracta*72. *Gl. sagittata*73. *Gl. arcana*74 *Gl. argenteola*74 *Gl. argenteola*75. *Gl. diversa*76 *Br. abdominalis*77. *Pe. spatulata*78 *Pe. recurvata*79 *Gl. labiata*

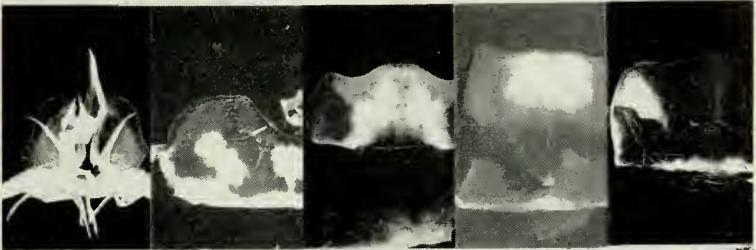
PLATE IX



79. *Gi. labiata*

80. *Gi. atrapunctata*

81. *Gi. faciatia*



82. *Do. stylata*

79. *Gi. labiata*

80. *Gi. atrapunctata*

82. *Do. stylata*



1. *At. gardenia*

2. *At. magdalena*

3. *At. fredonia*



4. *At. plana*

5. *At. incongrua*

6. *At. terebrans*

PLATE X

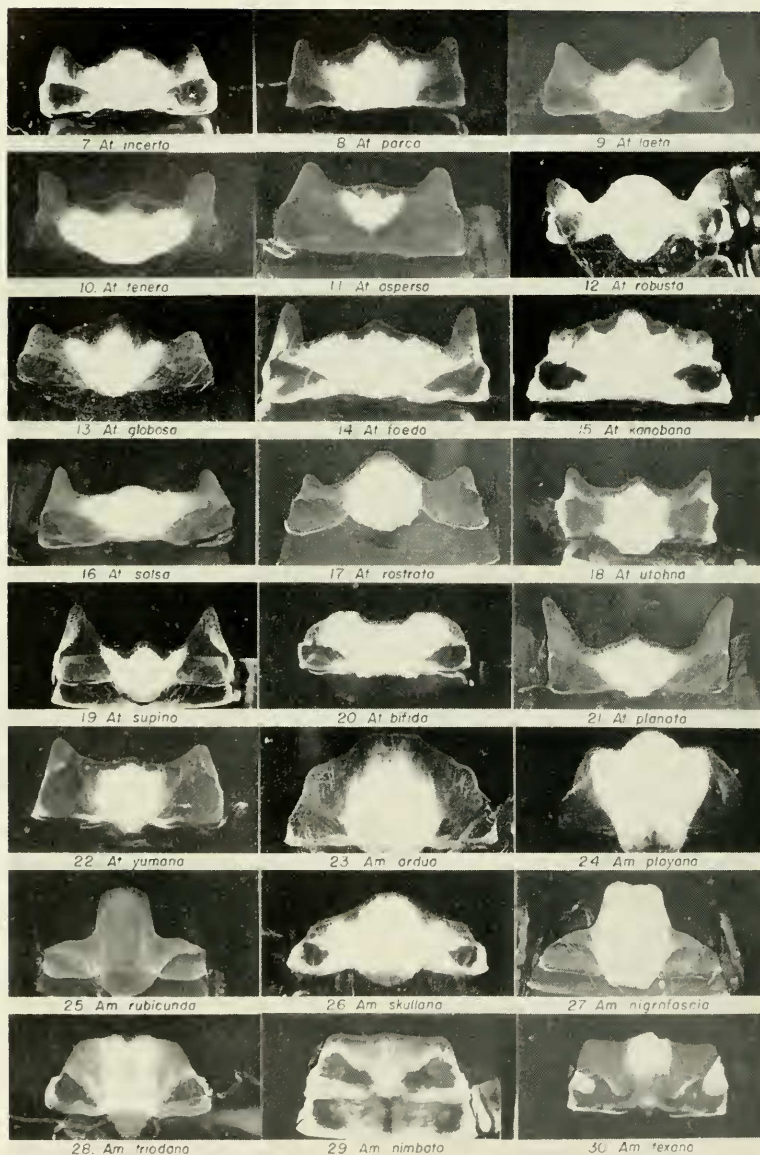


PLATE XI

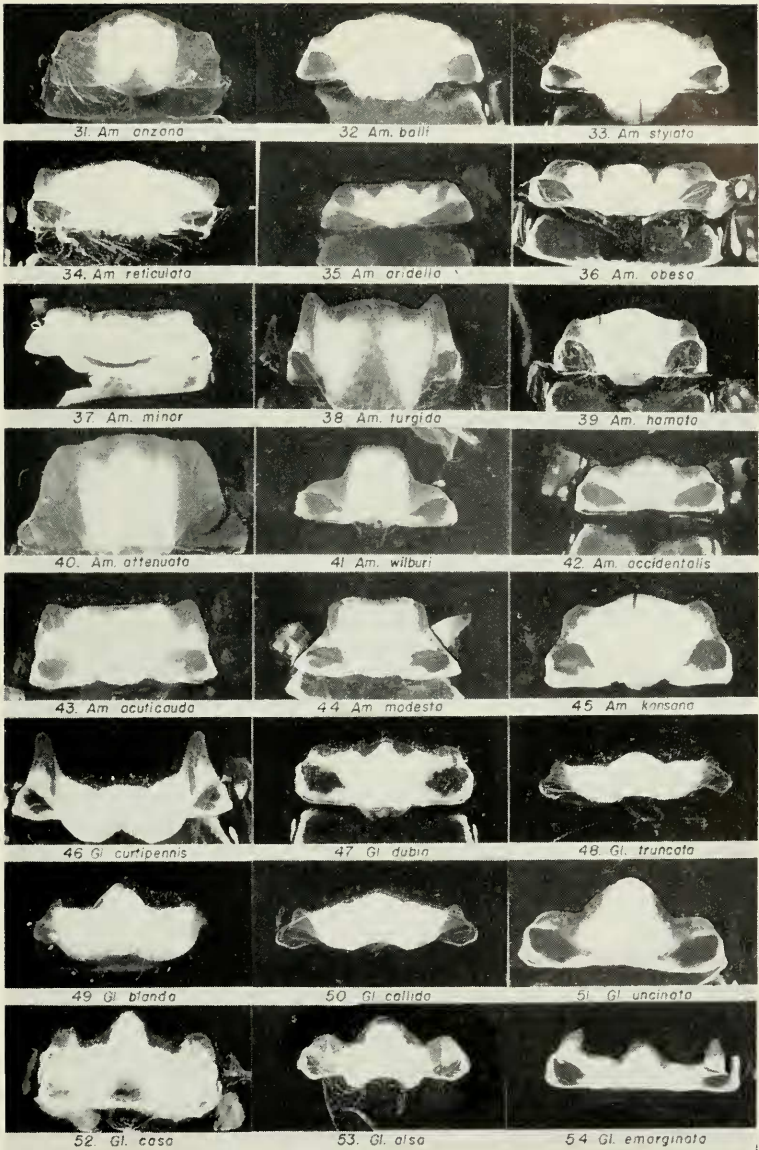


PLATE XII

